PACIFIC SEABIRDS

A Publication of the Pacific Seabird Group

Volume 41, Numbers 1 and 2 2014

PACIFIC SEABIRD GROUP

Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

The Pacific Seabird Group (PSG) was formed in 1972 due to the need for better communication among Pacific seabird researchers. PSG provides a forum for the research activities of its members, promotes the conservation of seabirds, and informs members and the public of issues relating to Pacific Ocean seabirds and their environment. PSG members include research scientists, conservation professionals, and members of the public from all parts of the Pacific Ocean. The group also welcomes seabird professionals and enthusiasts in other parts of the world. PSG holds annual meetings at which scientific papers and symposia are presented; abstracts for meetings are published on our web site. The group is active in promoting conservation of seabirds, including seabird/fisheries interactions, monitoring of seabird populations, seabird restoration following oil spills, establishment of seabird sanctuaries, and endangered species. Policy statements are issued on conservation issues of critical importance. PSG's journals are *Pacific Seabirds* (formerly the PSG *Bulletin*) and *Marine Ornithology*. Other publications include symposium volumes and technical reports; these are listed near the back of this issue. PSG is a member of the International Union for Conservation of Nature (IUCN), the Ornithological Council, and the American Bird Conservancy. Annual dues for membership are $30 (individual and family); $24 (student, undergraduate and graduate); and $900 (Life Membership, payable in five $180 installments). Dues are payable to the Treasurer; see the PSG web site, or the Membership Information at the back of this issue.

World Wide Web Site

http:// www.pacificseabirdgroup.org

Donations

The Pacific Seabird Group is a nonprofit organization incorporated under the laws of the State of California. Contributions to the Pacific Seabird Group are tax deductible to the fullest extent allowed by U.S. law (IRS Section 501[c][3]).

Pacific Seabirds

This journal has published short peer-reviewed articles, reports of ongoing work, conservation news, and other items of importance to conservation of seabirds in the Pacific Ocean. The journal is published twice a year in spring and fall. Materials should be submitted to the Editor. Information for contributors to *Pacific Seabirds* is published in each Fall issue and is on PSG's web site. Editorial policies accord with those of PSG's Executive Council; in other matters the journal aims for an unbiased point of view. Back issues of the *PSG Bulletin* and *Pacific Seabirds* are posted on the group's web site or may be ordered from the treasurer (see Membership/Order Form next to inside back cover for details). Submission deadlines are 20 March for the spring issue and 1 October for the fall issue; manuscripts may be submitted at any time.

Pacific Seabirds Interim Editor (for this issue only)

Holly Freifeld, U.S. Fish and Wildlife Service, 911 NE 11th Ave., Portland, OR 97232

Associate Editors for This Issue

Heather Major, Marc Romano, Leslie Slater, Julia Sommerfeld, W. Breck Tyler; layout: Patrick Stark

Marine Ornithology

Marine Ornithology presents peer-reviewed contributions concerning international seabird science and conservation. The journal is published two times a year. It is available on its web site (www.marineornithology.org) or by subscription. The journal is supported by a partnership of global seabird societies, including the Pacific Seabird Group (PSG), African Seabird Group, Australasian Seabird Group, the Seabird Group (UK), Dutch Seabird Group, and Japan Seabird Group. For further information see www.marineornithology.org

Change of Address

Send changes of address to the PSG Membership Coordinator, **Jennifer Ma**, School of Aquatic and Fishery Sciences, University of Washington, Box 355020, Seattle, WA 98195; email: membership@pacificseabirdgroup.org

PACIFIC SEABIRDS

A Publication of the Pacific Seabirds Group

Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

Volume 41 **2014** **Numbers 1 and 2**

Note from the interim editor: The following article represents Vivian Mendenhall's final editorial contribution to Pacific Seabirds. All credit for the appearance of this paper in this issue is due to Vivian, her close collaboration with the lead author, and her meticulous attention to detail.

SEABIRD BYCATCH IN CHILE: A SYNTHESIS OF ITS IMPACTS, AND A REVIEW OF STRATEGIES TO CONTRIBUTE TO THE REDUCTION OF A GLOBAL PHENOMENON

By Cristián G. Suazo[1, 2,*], Luis A. Cabezas[2, 3], Carlos A. Moreno[4], Javier A. Arata[5], Guillermo Luna-Jorquera[6], Alejandro Simeone[7], Luis Adasme[8], Jorge Azócar[8], Marcelo García[9], Oliver Yates[10], and Graham Robertson[11]

[1] Department of Animal Ecology and Systematics, Justus Liebig University Giessen, Heinrich-Buff-Ring 38, 35392 Giessen, Germany.
[2] Albatross Task Force, BirdLife International, Chile.
[3] Facultad de Ciencias del Mar y de Recursos Naturales, Universidad de Valparaíso, Casilla 5080, Reñaca, Viña del Mar, Chile.
[4] Instituto de Ciencias Ambientales y Evolutivas, Facultad de Ciencias, Universidad Austral de Chile, Casilla 567, Valdivia, Chile.
[5] Instituto Antártico Chileno, Plaza Benjamín Muñoz Gamero 1055, Punta Arenas, Chile.
[6] Departamento de Biología Marina, Facultad de Ciencias del Mar, Universidad Católica del Norte, Larrondo 1281, Coquimbo, Chile.
[7] Departamento de Ecología y Biodiversidad, Facultad de Ecología y Recursos Naturales, Universidad Andrés Bello, República 470, Santiago, Chile.
[8] Departamento de Evaluación de Pesquerías, División de Investigación Pesquera, Instituto de Fomento Pesquero, Blanco 839, Valparaíso, Chile.
[9] Unidad Biodiversidad y Patrimonio Acuático, Departamento de Pesquerías, Subsecretaría de Pesca y Acuicultura, Gobierno de Chile, Bellavista 168, Valparaíso, Chile.
[10] BirdLife International Marine Programme, Casilla 145, La Serena, Chile.
[11] Australian Antarctic Division, 203 Channel Highway, Kingston, Tasmania 7050, Australia.

* Corresponding author: biosuazo@gmail.com

Abstract

Chile holds globally important colonies of endangered and endemic seabird species, and globally vulnerable nonbreeding species visit its waters. One of the major threats for seabirds in Chilean waters is the impact of fishing activities, both industrial and artisanal, which overlap with seabird breeding and foraging areas. Bycatch in fisheries threatens 27 identified species and two groups of unidentified albatrosses and penguins, with the Black-browed Albatross *Thalassarche melanophrys* as the species most related to bycatch events. Responding to the international call for the voluntary adoption of a plan to reduce the impacts of fisheries on seabirds, Chile generated a National Plan of Action (PAN-AM/Chile) to monitor seabird bycatch, and to mitigate threats to seabirds with emphasis on industrial longline fisheries. Following the successful reduction of seabird bycatch in the demersal longline fishery for Patagonian toothfish *Dissostichus eleginoides*, with zero individuals caught during 2006, Chile is extending the PAN-AM/Chile to include other fisheries that use gear known to cause incidental mortality, such as trawl, purse seine, and gillnets. This initiative is supported by actions associated with the creation of a national scientific committee for biodiversity, and new collaborative research platforms under the auspices of the Chilean Undersecretariat for Fisheries and Aquaculture.

Keywords: Albatross, conservation, fisheries, gillnet, Humboldt Current System, longline, mortality, Oceanic Islands, purse seine, Subantarctic, trawl

Resumen

Chile cuenta con importantes colonias a nivel global de especies de aves marinas endémicas y en peligro, así como especies no reproductivas globalmente vulnerables que visitan sus aguas. Una de las mayores amenazas para las aves marinas en aguas chilenas es el impacto de las actividades pesqueras, tanto industriales y artesanales, las cuales se sobreponen con áreas de reproducción y alimentación de aves marinas. Estas amenazan 27 especies identificadas y dos grupos de albatross y pingüinos no identificados, con el Albatros de ceja negra *Thalassarche melanophrys* como la especie más relacionada a eventos de captura incidental. Respondiendo al llamado internacional para la adopción voluntaria de un plan para reducir los impactos de las pesquerías en aves marinas, Chile generó un Plan de Acción Nacional (PAN-AM/Chile) para monitorear la captura incidental de aves marinas y mitigar amenazas con énfasis en pesquerías industriales de palangre. Seguido a la exitosa reducción de la captura incidental en la pesquería demersal de palangre para Bacalao de profundidad *Dissostichus eleginoides*, con cero individuos capturados durante 2006, Chile está ampliando el PAN-AM/Chile para incluir otras pesquerías que usan artes de pesca con conocida mortalidad incidental, tales como arrastre, cerco y redes agalleras. Esta iniciativa es apoyada por acciones asociadas con la creación de un comité científico de biodiversidad y nuevas plataformas de investigación colaborativa, bajo los auspicios de la Subsecretaría de Pesca y Acuicultura de Chile.

Palabras clave: Albatros, arrastre, cerco, conservación, Islas Oceánicas, mortalidad, palangre, pesquerías, red agallera, Sistema de Corriente de Humboldt, Subantártico

INTRODUCTION

Bycatch is recognized as the major threat to the conservation of seabird species worldwide. The high rate of mortality in these long-lived species is conducive to population declines, and is due to interaction with different fishing gears (Croxall et al. 2012) with its negative effects on demographic status.

The high biological productivity associated with Chile's coast supports major fisheries that operate both in coastal and pelagic waters in these regions, and that deploy a variety of fishing gear, such as demersal and mid-water longline, trawl, gillnet and purse seine. In addition, these activities frequently overlap with breeding and non-breeding seabird species prone to negative interactions with fishing gear such as the hooks of longliners, collisions with cables in trawlers, and entanglement in net gear such gillnet and purse seine.

The important role of Chile for seabird conservation is highlighted especially because the nation's waters include globally important breeding grounds for some albatrosses (e.g. Black-browed *Thalassarche melanophrys*), colonies with endemic species (e.g. Pink-footed Shearwater *Puffinus creatopus*), and non-breeding visiting species such as albatrosses (Diomedidae) from New Zealand (BirdLife International 2004). All these species are overlapping with some of the scattered fishing activities in Chilean waters, whose fishing effort is distributed between industrial and artisanal (i.e. small-scale) fishing. Industrial fishing vessels are >18 m in length. Artisanal activities are related mainly to manual operations in small boats or semi-industrial vessels <18 m; these small-scale activities have a legal exclusive fishing area of 5 miles from the coastline.

The present work includes a review of Chile's actions related to seabird bycatch in different seabird endemism area in Chilean waters. Our paper includes both published information and new data. We also include future steps relating to different stakeholders' collaboration, government actions, and further research to assess Chile's part in the global impact of fisheries on seabird populations.

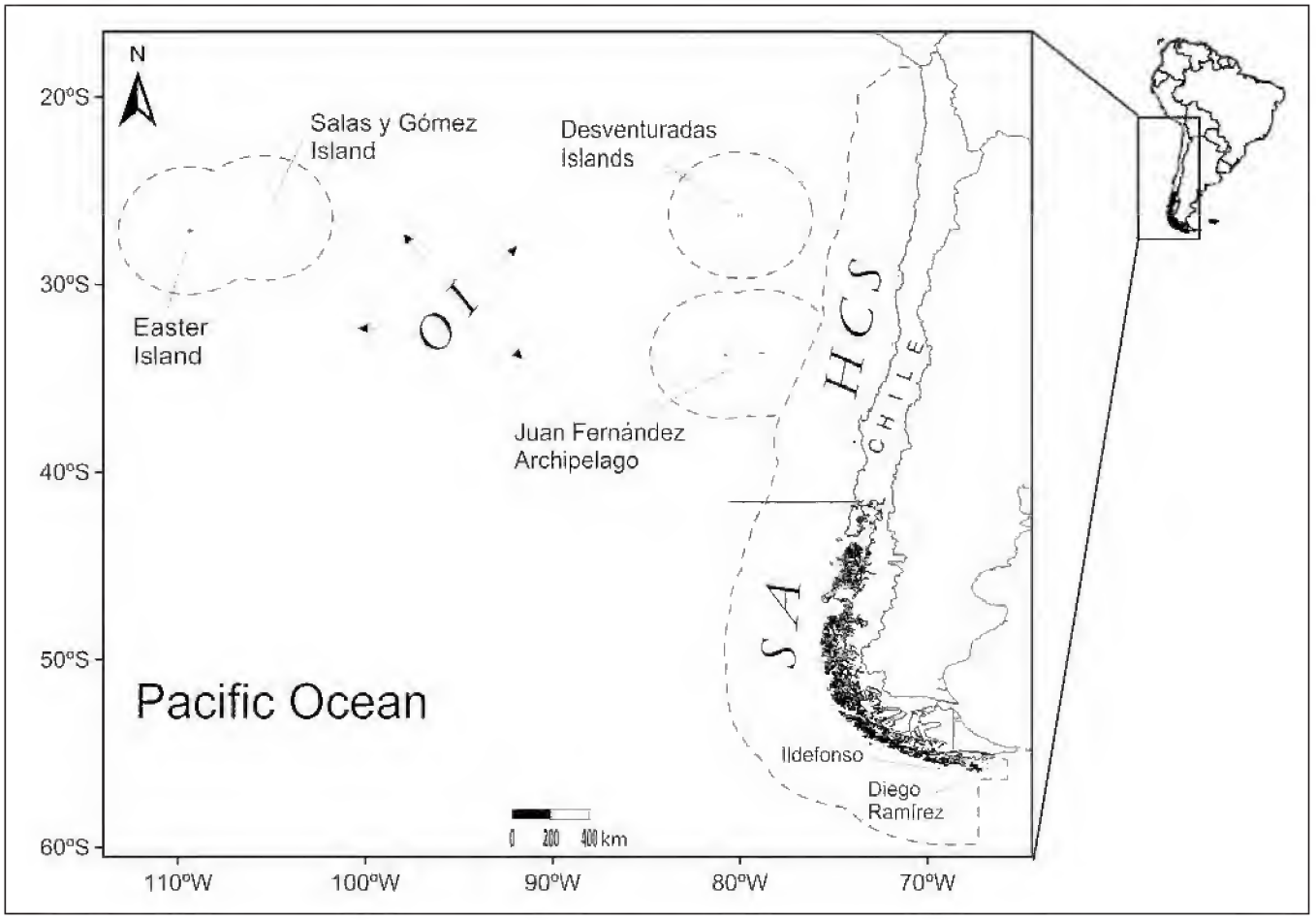


FIGURE 1. Chilean seabird endemism areas: (HCS) Humboldt Current System; (OI) Oceanic Islands, and (SA) Sub-Antarctic islands and fjords (Schlatter and Simeone 1999). Dashed line along the Chilean coast and around the Oceanic Islands represent Chile's Exclusive Economic Zone (EEZ).

Table 1. Fisheries, target resources, and observer coverage during different studies focused on seabird bycatch in Chilean waters. Seabird endemism areas: SA = Subantarctic islands and fjords; HCS = Humboldt Current System; OI = Oceanic Islands (see text for details)

Fishery	General latitude range of fishery[a]	Fishing depth (m)[a]	Seabird endemism area	Observation effort (% of total fishing)	Period covered	Observers on board	Source
Industrial demersal longline for Patagonian toothfish *Dissostichus eleginoides*	South of 47°S	168–2,250	SA	222 sets, 1,310,585 hooks (21%)	2001 (exploratory); 2002–2003 (study)	Trained (seabird identification and mortality assessment)	Moreno et al. (2003)
Industrial demersal longline for austral hake *Merluccius australis* and ling *Genypterus blacodes*	45°–57°S	200–600	SA	96 sets	October-November 2003; March 2004	Trained	Unpubl. data, Moreno et al. (2003), Moreno and Arata (2004); cited by Robertson et al. (2014)
Artisanal demersal longline for austral hake and ling	41°–45°S	100–500	SA	388 sets, 330,632 hooks (78.3%).	1999	Trained	Moreno et al. (2006)
Artisanal demersal longline for Patagonian toothfish	41°–47°S	1,000–2,000	SA, HCS	82 sets, 88,280 hooks (total fishing effort unknown)	2002	Trained	Moreno et al. (2006)
Industrial pelagic longline for swordfish *Xiphias gladius*	29°–32°S	4–10	HCS, OI	Vessels <28m: 1,856 sets, 2,312,258 hooks (62%); Vessels >28m: 864 sets, 1,353,418 hooks (97%)	February 2007–October 2009	Trained (seabird identification and mortality assessment)	Azócar et al. (2010)
Industrial demersal trawl for austral hake, southern blue whiting *Micromesistius australis* and hoki *Macruronus magellanicus*	43°–53°S	200–500	SA	76 trawls (14.3%)	2nd half of 2012	Trained (seabird identification and mortality assessment)	Céspedes et al. (2012)
Industrial demersal trawl for south Pacific hake *Merluccius gayi gayi*	34°–39°S	150–800	HCS	198 trawls (66.7%)	June 2011–August 2012	Trained observer-instructors (instructing scientific fisheries observers on seabird study)	ATF–Chile (2013)

[a] Robertson et al. (2014)

FIGURE 2. Training workshop on seabird identification and bycatch monitoring. ATF-Chile instructors are training IFOP's scientific observers. Photo by L.A. Cabezas.

METHODS

Endemism areas of seabirds in Chilean waters

Chile's linear coastline extends approximately 4000 km, from Latitude 18°21' south to 60° south (Figure 1). Chilean seas can be subdivided into three main seabird endemism areas (Schlatter and Simeone 1999). These are (i) the Subantarctic islands and fjords (SA), from Chiloé to south of the Diego Ramírez archipelago (41°47' south to 60° south); (ii) the Humboldt Current System (HCS), from the northern limit (18°21' south) to Chiloé Island (41°47' south); and (iii) the Oceanic Islands (OI), comprising Easter Island, Salas y Gómez Island, Desventuradas Islands, and the Juan Fernández Archipelago.

Seabird bycatch in Chilean waters

We review the history and state of knowledge of seabird bycatch in Chilean waters, and also current information and actions on these topics. The main sources of new information are key contributions from unpublished field records and local literature searches. From this, we present a summary of fisheries covered by scientific observers (Table 1). Table 1 is presented in relationship to three main sources of seabird bycatch information for Chilean waters: (i) the National Plan of Action for Reducing Bycatch of Seabirds in Longline Fisheries (PAN-AM/Chile); (ii) Instituto de Fomento Pesquero (Institute for the Promotion of Fisheries [IFOP]); and (iii) the Albatross Task Force–Chile (ATF-Chile).

IFOP and ATF-Chile cooperate in providing bycatch observers. IFOP provides scientific observers; they are trained in seabird identification and bycatch monitoring during workshops by ATF-Chile instructors (Figure 2). The observers are later assigned by local authorities during government fisheries programs, or are authorized to deploy as independent monitors on focal fisheries.

In addition, local researchers are taking the first steps in the field to identify and quantify seasonal interactions between seabirds and unassessed fisheries, including the industrial and artisanal purse seine fisheries, and the artisanal gillnet fishery at various latitudes along the Chilean coast. Information from different initiatives is currently available in the form of unpublished results, which are especially associated with small-scale (artisanal) fisheries.

RESULTS AND DISCUSSION

Biological diversity: Seabirds in Chilean waters

Several breeding colonies of seabirds are found in this mosaic of different endemism areas, including petrels and shearwaters (Procellariidae), gulls (Laridae), pelicans (Pelecanidae), penguins (Sphenisciformes), and albatrosses (Diomedidae). These areas are also frequented by a range of non-breeding species, including those coming from southern and tropical regions. They include albatrosses such as the Salvin's *Thalassarche salvini*, Chatham *T. eremita*, Royal *Diomedea epomophora* and *D. sanfordi*, Wandering *D. exulans*, Antipodean *D. antipodensis*, and Waved *Phoebastria irrorata*, all of which are considered globally threatened species (IUCN 2013).

As examples, the HCS in particular is considered one of the most productive marine systems in the world (Belkin 2009) and holds a large number and abundance of seabird species (Spear and Ainley 2008). On the other hand, the SA region is a complex geographic area with thousands of islands, fjords and channels. In this part of Chile there are important breeding sites for albatrosses, shearwaters and penguins. For albatrosses the two most important islands are Diego Ramírez and Ildefonso in the southern section of this region (between 55°48' and 56°31' south; Figure 1), which together hold over 20% of the global populations of Black-browed and Gray-headed *Thalassarche chrysostoma* Albatrosses (Robertson et al. 2007; Moreno and Robertson 2008).

In a global assessment of seabird conservation status, threats and priority actions, Chile was listed in the top three most important countries in terms of the number of breeding seabird species and the total number of visitor species recorded within waters of national Exclusive Economic Zones (EEZ) (Croxall et al. 2012). These authors attribute commercial fisheries as one of the principal threats to seabirds.

Fisheries interactions: Background on seabird bycatch in Chilean waters

The attraction of seabirds to fishing vessels is due to the presence of discards and/or offal at the sea surface. This is particularly true for trawl vessels with onboard processing facilities (ATF-Chile 2013). In longline fisheries an additional attraction is the use of fish and/or squid as bait (Moreno et al. 2007). In purse seine fisheries seabirds often forage on the same species targeted by the fishery (Schlatter et al. 2009). Negative interactions between seabirds and fisheries occur when seabirds: (i) collide with cables that support trawl nets (trawl warp cable) or are used to communicate with net sensors (third wire); (ii) become entangled in nets or lines; or (iii) are hooked. While all these interactions can cause injury through trauma, the main cause of mortality is drowning. At least 27 identified seabird species and unidentified penguins and albatrosses (Table 2) were identified among the seabird bycatch for Chilean waters.

Table 2. Seabird species for which mortality records in Chilean fisheries exist (years 1999-2014). *Gear:* G = Gillnet, PS = Purse seine, T = trawl, DL = Demersal longline, PL = Pelagic longline; *Size category of fishery:* (A) = Artisanal, (I) = Industrial. *Endemism area*: SA = Subantarctic islands and fjords, HCS = Humboldt Current system, OI = Oceanic islands. *IUCN status:* LC = Least concern, NT = Near threatened, VU = Vulnerable, EN = Endangered (IUCN 2013). See text for details.

Species	Fishery	Endemism area	IUCN status (population trend)	Source
Wandering Albatross *Diomedea exulans*	PL(I)	OI	VU (decreasing)	ATF (2007), González et al. (2012)
Southern Royal Albatross *D. epomophora*	PL(I)	OI	VU (stable)	González et al. (2012)
Black-browed Albatross *Thalassarche melanoprys*	DL(I), DL(A), T(I), PL(I)	SA, HCS, OI	NT (decreasing)	Moreno et al. (2003), ATF (2007), Céspedes et al. (2012), ATF–Chile (2013), Suazo et al. (2013)
Gray-headed Albatross *T. chrysostoma*	DL(I), PL(I)	SA, OI	EN (decreasing)	Moreno et al. (2003), González et al. (2012)
Salvin's Albatross *T. salvini*	T(I), L(I)	HCS, OI	VU (unknown)	ATF (2007), ATF-Chile (2013)
Buller's Albatross *T. bulleri*	PL(I)	OI	NT (stable)	ATF (2007), González et al. (2012)
Shy Albatross *T. cauta*	PL(I)	OI	NT (unknown)	Moreno et al. (2007)
Albatross (unidentified) Diomededae	PL(I)	OI	—	ATF (2007)
Southern Giant Petrel *Macronectes giganteus*	T(I), PL(I)	SA, OI	LC (increasing)	ATF (2007), Céspedes et al. (2012)
Northern Giant Petrel *M. halli*	PL(I)	OI	LC (increasing)	González et al. (2012)
Southern Fulmar *Fulmarus glacialoides*	DL(I), PL(I), T(I)	SA, HCS	LC (stable)	Moreno et al. (2003), González et al. (2012), IFOP (unpubl. data)
Cape Petrel *Daption capense*	DL(I), T(I), PL(I)	SA, HCS, OI	LC (stable)	Moreno et al. (2003, Céspedes et al. (2012), González et al. (2012), ATF-Chile (2013)
White-chinned Petrel *Procellaria aequinoctialis*	DL(I,A), T(I), PL(I)	SA, HCS, OI	VU (decreasing)	Moreno et al. (2003, 2006), ATF (2007), Céspedes et al. (2012), ATF-Chile (2013)
Westland Petrel *Procellaria westlandica*	DL(I)	SA	VU (stable)	Cabezas (unpubl. data)
Gray Petrel *Procellaria cinerea*	PL(I)	OI	NT (decreasing)	Moreno et al. (2007)
Common Diving Petrel *Pelecanoides urinatrix*	DL(I)	SA	LC (decreasing)	Moreno et al. (2003)
Pink-footed Shearwater *Puffinus creatopus*	PS(I,A), T(I)	HCS	VU (unknown)	Cabezas and Suazo (2011), ATF–Chile (2013), Suazo (unpubl. data)
Sooty Shearwater *P. griseus*	DL(I), PS(A,I)	SA, HCS	NT (decreasing)	Brito (2002), Moreno et al. (2003), Suazo and Steffen (unpubl. data)
Peruvian Pelican *Pelecanus thagus*	PS(I,A), T(I)	HCS	VU (stable)	Brito (2002, ATF-Chile 2013), ATF-Chile (unpubl. data)

Table 2, continued

Species	Fishery	Endemism area	IUCN status (population trend)	Source
Peruvian Booby *Sula variegata*	PS(A)	HCS	LC (stable)	ATF-Chile (unpubl. data)
Guanay Cormorant *Phalacrocorax bougainvillii*	G(A), PS(I,A)	HCS	NT (decreasing)	Simeone et al. (1999), Brito (2002)
Red legged Cormorant *P. gaimadi*	G(A)	HCS	NT (decreasing)	Simeone et al. (1999), Suazo and Steffen (unpubl. data)
Neotropical Cormorant *P. brasilianus*	PS(A)	HCS	LC (increasing)	IFOP (unpubl. data)
White-tailed Tropicbird *Phaethon lepturus*	PL(I)	OI	LC (decreasing)	González et al. (2012)
Kelp Gull *Larus dominicanus*	DL(A), T(I)	SA, HCS	LC (increasing)	Moreno et al. (2006), ATF–Chile (2013)
Gray Gull *Larus modestus*	PS(A)	HCS	LC (decreasing)	ATF–Chile (unpubl. data)
Humboldt Penguin *Spheniscus humboldti*	G(A), PS(I,A)	HCS	VU (decreasing)	Simeone et al. (1999), Brito (2002)
Magellanic Penguin *S. magellanicus*	DL(A), G(A), PS(A)	SA, HCS	NT (decreasing)	Simeone et al. (1999), Ojeda et al. (2011), Pütz et al. (2011), Suazo et al. (2013), Suazo and Steffen (unpubl. data)
Penguin (unidentified) *Spheniscus* sp.	DL(A), G(A)	SA, HCS	—	Simeone et al. (1999), Moreno et al. (2006)

Interactions in the Subantarctic (SA)—The SA region is a complex geographic area and an important fishing ground for demersal species such as the austral hake *Merluccius australis*, ling *Genypterus blacodes*, and Patagonian toothfish *Dissostichus eleginoides*, which are targeted by trawlers and by both artisanal and industrial longliners. Observation of industrial demersal longline fishing operations in the Patagonian toothfish fishery indicated that 1588 seabirds were killed during 2002 (Moreno and Arata 2006; Moreno et al. 2008). The Black-browed Albatross was the most-affected species, with 97.9% of the overall mortality. Observation of artisanal demersal longline operations in the fjords and channels of Patagonia recorded minimal numbers of seabird bycatch (Moreno et al. 2006, Suazo et al. 2013). This was mainly attributed to the faster sink rates of demersal fishing lines, due to a weight (0.3–1 kg) attached near the end of each secondary line with a series of hooks, which reduces the access of seabirds to baited hooks (for details see Moreno et al. 2006).

Four species were recorded in bycatch events for the industrial demersal trawl in the SA area during spring–summer (Céspedes et al. 2012). The estimated mortality rate was 1.77 birds/trawl (Table 3), with the Black-browed Albatross as the main bycatch (92.5%), along with three petrel species. In contrast, studies in other regions showed lower mortality rates, with a mean 0.26 birds/trawl for the squid fishery around the Snares and Auckland Islands, New Zealand (Bartle 1991), and maximum rate of 0.11 birds/trawl during demersal fish catches around the Kerguelen Islands, Indian Ocean (Weimerskirch et al. 2000), both during the austral summer.

Interactions in the Humboldt Current System (HCS)—Seabird bycatch evidence in the HCS indicates that pursuit-diving seabirds such as penguins and shearwaters are killed incidentally during their winter migration towards lower latitudes. Magellanic *Spheniscus magellanicus* and Humboldt *S. humboldti* Penguins are vulnerable to drowning in industrial and artisanal purse seines and gillnets (Simeone et al. 1999; Schlatter et al. 2009, Pütz et al. 2011, ATF-Chile unpubl. data); 1380 individuals were recorded in a single mass-mortality event in purse seine gear (Schlatter et al. 2009). These fisheries target small pelagic species, principally the anchovy *Engraulis ringens* and common sardine *Strangomera bentincki*. Pelicans, boobies (Sulidae), shearwaters,

and cormorants (Phalacrocoracidae) are also killed or injured in these types of fisheries (see Table 2). Gillnets are deployed in artisanal fisheries along the Chilean coast (mainly between 18° and 42° south) for pelagic species such as the palm ruff *Seriorella violacea* and corvina drum *Cilus gilberti*. While no official seabird mortality estimates exist for these fisheries (Žydelis et al. 2013), unpublished data suggest that artisanal gillnets may kill >5000 birds per year in southern Chile alone (Luna-Jorquera unpubl. results).

Another fishery that impacts seabirds in the HCS is the industrial trawl fishery for south Pacific hake *Merluccius gayi gayi*. Seven species among albatrosses, pelicans, petrels, shearwaters and gulls are affected (Table 2). A monitoring effort of 198 trawls over 15 months during 2011 and 2012 indicated a higher the estimated mortality during summer than winter, reaching 890 seabirds (0.098 birds/trawl) through collisions with cables (ATF-Chile 2013; Table 3). The near-threatened Black-browed Albatross was the most-affected species, representing 35% of the total mortality.

During this same study on trawl in the HCS, hourly mortality rates for summer (0.031 birds/hour for spring–summer) were lower than estimations for the Falklands trawl fishery during the austral spring (0.082 birds/hour; Sullivan et al. 2006) and around important breeding grounds for Black-browed Albatrosses. However, during winter the trawl mortality rates for the HCS reached 0.152 birds/hour. The latter figure includes non-breeding subantarctic breeders such as Black-browed Albatrosses, in addition to endemic species from the SA such a Peruvian Pelican *Pelecanus thagus*. Thus, this review shows the importance of assessing bycatch as a function of contrasting seasonal blocks, an approach that is adjusted to seasonal abundance and distribution patterns of seabirds.

Our observations in this trawl fishery have detected seabird mortality due to net entanglements that occur while the gear is floating at the sea surface, when birds forage on fish remains or whole fish

Table 3. Seabird bycatch rates in longline and trawl fisheries for different seabird endemism areas in Chilean waters. Seabird endemism areas: SA = Subantarctic islands and fjords, HCS = Humboldt Current system, OI = Oceanic islands (see text for details). All bird species are combined for each fishery and study.

Fishery	Seabird endemism area	Bycatch rate	Source
Industrial demersal longline for Patagonian toothfish *Dissostichus eleginoides*	SA	1.285 birds/1000 hooks	Moreno et al. (2003)
Industrial demersal longline for austral hake *Merluccius australis* and ling *Genypterus blacodes*	SA	0.018 birds/1000 hooks for Black-browed Albatross	Unpubl. data, Moreno et al. (2003), Moreno and Arata (2004); cited by Robertson et al. (2014)
Artisanal demersal longline for austral hake and ling *Genypterus blacodes*	SA	0.030 birds/1000 hooks	Moreno et al. (2006)
Artisanal demersal longline for Patagonian toothfish	SA, HCS	0.047 birds/1000 hooks	Moreno et al. (2006)
Industrial pelagic longline for swordfish *Xiphias gladius*	OI	0.032-0.104 birds/1,000 hook	Azócar et al. (2010)
Industrial demersal trawl for austral hake, southern blue whiting *Micromesistius australis*, and hoki *Macruronus magellanicus*	SA	1.776 birds/trawl	Céspedes et al. (2012)
Industrial demersal trawl for south Pacific hake *Merluccius gayi gayi*	HCS	0.393 birds/trawl (winter), 0.098 birds/trawl (summer); 0.152 birds/trawling hour (winter), 0.031 birds/ trawling hour (summer)	ATF - Chile (2013)

that are stuck in the folds and mesh of the trawl. Although no counter-measures were trialled in our study period, the use of net binding has prevented similar net entanglements in other fisheries (Roe 2005). Before each setting, the net is bound at intervals with breakable strings, which prevents the mesh from opening on the surface and improves its rate of sinking. However, a simpler method to prevent this source of seabird interaction is the habitual cleaning of nets before the next trawl is deployed. This involves shaking fish remains out the mesh while preparing the gear on deck.

Entanglement of scavenging birds should not be underestimated for Chile, where mortalities associated with net entanglement at the surface reached up 37% of all dead birds (ATF–Chile 2013). Thus, overall estimations of bycatch for trawl fisheries should be considered as conservative, since cryptic sources of mortality may exist. These can include net entanglements on the surface and strikes with trawl gear cables, even when no seabird bycatch has been recorded in the gear when it is retrieved on board.

Interactions in the Oceanic Islands (OI)— The waters around the OI support a pelagic longline fishery for swordfish *Xiphias gladius,* sharks, and tunas (e.g. blue shark *Prionace glauca* and bigeye tuna *Thunnus obesus*). A total of 12 species of seabird have been reported taken incidentally in this fishery (González et al. 2012). The main species killed are Black-browed Albatrosses, Wandering Albatrosses, and White-chinned Petrels *Procellaria aequinoctialis* (Table 2), with a higher occurrence of these events during winter (Azócar et al. 2010, Barría et al. 2012, González et al. 2012). The greatest bycatch record for this fishery was in 2007, with 128 individuals (73.9% of all mortality) from 11 species, among them albatrosses, petrels, and shearwaters (Azócar et al. 2010; Table 3). Subsequently, when larger vessels (>28 m) left the fishery after 2007, seabird mortality dropped to a level of around 20 individuals per year during the next two monitored periods (Azócar et al. 2010). This pelagic longline fishery potentially impacts other migratory species from New Zealand, Australia and the Chilean oceanic islands. These include the Black petrel *Procellaria parkinsoni* (Cabezas et al. 2012), and the Juan Fernández *Pterodroma externa* and Masatierra *P. defilippiana* Petrels (Cabezas unpubl. data).

Seabird bycatch mitigation in Chile

A national commitment: Government initiatives and researchers' participation— Since the earliest records of Procellariiform mortality in fisheries (Brothers 1991), longline fishing has increasingly been recognized as one of the main threats to albatross and petrel populations globally (Anderson et al. 2011). The United Nations Food and Agriculture Organization's International Plan of Action (FAO 1999) called for member states to respond to this issue by developing a national plan of action to reduce the bycatch of seabirds in their EEZs. In 2001, Chile started a process of expert consultation through the Fisheries Research Fund (Fondo de Investigación Pesquera [FIP]; www.fip.cl), which generated participation in the diagnosis of seabird mortality levels and the development of PAN-AM/Chile.

The strategy to reach the objectives of this plan involved the following steps: (i) estimate the magnitude of the problem in the Chilean EEZ; (ii) develop an action plan, if needed; (iii) implement mitigation measures in fisheries where negative interactions occur with seabirds; (iv) research, and (v) training of fishermen on the issue of bycatch and mitigation measures (Moreno and Arata 2005). This process was focused on the Chilean longline fleet, and particularly the fisheries for Patagonian toothfish and swordfish.

PAN-AM/Chile was established through Supreme Decree No. 136 of 2007, issued by Chilean fisheries authorities and supported with the signature of Chile's president. The plan specified mandatory measures for three longline fisheries. In the Patagonian toothfish longline fishery, these measures included the use of bird-scaring streamer lines during all sets and the use of 8.5-kg weights placed every 40 meters on the main line (Moreno and Arata 2005). These two measures deter seabirds from attacking baited hooks and reduce the amount of time baited hooks are available at the sea surface, respectively. In the austral hake and ling longline fishery, night setting was recommended as the main mitigation measure, complemented with the use of streamer lines during all sets and the use of 8-kg weights (no distance specified) on the main line. For the swordfish pelagic longline fishery, prescribed mitigation measures included night setting, the use of streamer lines, and the addition of 60- to 75-g lead weights to branch lines to increase the sink rate (Moreno and Arata 2005). The weights are on lead swivels that are attached to the monofilament line with crimps, and placed ca. 3.5 m from the hook.

Following the development of the PAN-AM/Chile, the next stage was to monitor implementation and effectiveness. A more comprehensive monitoring program onboard the pelagic longline fleet revealed a higher mortality than previously identified (Moreno et al. 2007), including a greater number of visitor species in Chilean waters (Table 2). During this second stage of the PAN-AM/Chile for the swordfish fishery (supported by FIP), observations revealed low compliance in the use of streamer lines during day and night settings (Moreno et al. 2007), although the use of 60- to 75-g line weights was adopted throughout the fishery.

In the longline fishery for Patagonian toothfish, compliance with recommendations in the PAN-AM/Chile led to zero seabird mortality in 2006 (Moreno et al. 2007). This great achievement was attributed to a change in fishing technology, from the Spanish longline system to a "Chilean" longline or trotline system. As described in Robertson et al. (2008, 2014), the Spanish system uses two lines

set in parallel—a hauling line (*retenida*), and a hook line (*linea madre*) with numerous secondary lines or branch lines (*barandillos*) that connect the two main lines. In contrast, the Chilean longline system uses a single main line, equivalent to the Spanish *retenida*. Hooks are now attached to short snoods in clusters near the ends of each branch line, where a weight is also attached.

This fishing gear adaptation represented a technology transfer from the artisanal longline fishery for toothfish (boats <18 m long). Industrial fishermen configured the gear to include a 10-m secondary line placed every 20 m along the main line. Each secondary line carries 6 to 10 hooks, with a weight 4-8 kg at its terminal end; this makes the secondary line sink fast and prevents seabird bycatch (Moreno et al. 2008). A further improvement of the method made by fishermen included a "net sleeve" that covers the catch and prevents damage by sperm *Physeter macrocephalus* and killer whales *Orcinus orca* during hauling.

Adoption of the Chilean system was also supported by full compliance with measures proposed in the PAN-AM/Chile for the Patagonian toothfish longline fishery: (i) the disposal of processing discards on the opposite side of the vessel from the hauling bay, which avoids incidental capture of scavenging seabirds during hauling of the gear; (ii) setting lines with minimal deck lights; and (iii) the use of bird-scaring lines (Moreno et al. 2007). The transition from Spanish to Chilean gear configuration started during 2006-2007 and was completed in 2008. The measures are recognized among the most innovative initiatives in Chilean fisheries (Castilla et al. 2013). The changes are associated with an increase of 23% in breeding pairs of Black-browed Albatrosses from 2002 through 2012 at their two main colonies in SA Chile (Robertson et al. 2014). In this way, low-cost modifications to fishing gear can improve catches of target species and save seabirds from bycatch. These changes can easily be transferred and adopted by longline fleets around subantarctic waters.

On the other hand, a direct assessment of seabird bycatch and compliance with the mitigation measures proposed in the PAN-AM/Chile are still pending for the industrial longline fishery for austral hake in SA waters, as well as for other Chilean fisheries farther north.

In 2008 an expert consultation was held on technical guidelines for the application of best practices in the International Plan of Action/National Plan of Action for Seabirds (IPOA/NPOA–Seabirds; FAO 2008). This publication recommended the inclusion of trawl and gillnet fisheries in all National Plans for Action–Seabirds. Recognising this, the Albatross Task Force in central-southern Chile (latitude 33 to 42° south) assessed seabird interactions in the trawl fishery for south Pacific hake between June 2011 and August 2012. Of the 34 seabird species observed in this fishery, seven species were found to be vulnerable to mortality through collisions with trawl warp cables and the third wire (netsonde), plus entanglements in the net while foraging for offal and discards (Table 2). During this study, the experimental deployment of bird-scaring lines on 54.5% of the 198 monitored trawls resulted in zero bird mortalities through cable strikes, especially during the winter period when mortality events are almost six times higher than during summer (ATF-Chile 2013). This review, in addition with the current work carried out by scientific observers from IFOP in industrial trawl for austral hake in Subantarctic waters, has reinforced the sense of urgency to upgrade the implementation of the PAN-AM/Chile to include other fisheries.

New government initiatives for science-based seabird conservation—In 2011 the Chilean Undersecretariat for Fisheries and Aquaculture (Subsecretaría de Pesca y Acuicultura) created a National Scientific Committee for Biodiversity–Seabirds (Comité Científico Nacional de Biodiversidad–Aves Marinas; CCNB-AM) to support current and future conservation actions.

The CCNB-AM is a working group of scientists and conservation professionals with the objective to formulate scientifically supported recommendations on the population status, conservation, and fisheries interactions of seabirds. The goal is to apply practical knowledge to the conservation of seabirds in Chilean waters.

This includes a proposal for improvements to the existing PAN-AM/Chile, and

FIGURE 3. New efforts to understand seabird bycatch are concentrating on artisanal gill net and purse seine fisheries distributed in Chilean waters. *Top*: Gillnets in south-central Chile overlap with seasonal migration and juvenile dispersal of penguins, such as this juvenile Magellanic Penguin. *Bottom*: Purse seines operate in breeding and feeding areas of endemic species such as Pink-footed Shearwater. Photos by C.G. Suazo.

research to mitigate seabird mortality in all domestic fisheries through the adoption of best practices. A recent update of the General Law on Fisheries and Aquaculture (Law No. 20,657 of February 6, 2013) established mandatory technical support for decision-making (recommendations from experts). In order to implement this change, the Undersecretariat for Fisheries and Aquaculture has established eight new Technical Scientific Committees, including one dedicated to biodiversity and environmental issues. This development means that the former CCNB-AM has now been expanded to include the conservation of highly migratory species and sharks (Chondrichthyes) within a wider context for conservation of biodiversity.

Notwithstanding this change in committee structure, it is expected that the CCNB-AM will continue to improve PAN-AM/Chile, contribute new assessments and proposals for mitigation measures, and identify best fishing practices.

Finally, estimation of bycatch levels in any fishery is made more difficult by activities that are illegal, unregulated, and unreported. These are still a widespread issue among countries (Trouwborst 2008). In some cases, these activities are supported by organized groups (Österblom et al. 2011) with an international working structure to avoid regulatory actions by countries. On the Chilean scene, there are intrusions by artisanal vessels into other artisanal or industrial administrative fishing areas (Oyarzún et al. 2003). Industrial operations also overlap onto artisanal fishing grounds.

Under a wider view that includes international waters, the Chilean government is currently focused on acquiring international commitments to improve regulatory systems, through actions by its Ministry of Foreign Affairs (e.g. Our Ocean Conference). In addition, local actions through the fisheries authorities are on the current agenda, in order to address the problem of intrusions with measures such as remote tracking of vessels and monitoring of onboard practices.

New efforts: other fisheries— Currently, local researchers are taking the first steps in the field to identify and quantify seasonal interactions between seabirds and unassessed fisheries. They are focusing on the industrial and artisanal purse seine fisheries and the artisanal gillnet fishery at various latitudes along the Chilean coast, which strongly affect diving species such as shearwaters, cormorants, and penguins through entanglement in fishing gear (ATF-Chile unpubl. data; Suazo and Steffen unpubl. data; Figure 3). One example comes from artisanal purse seine fishery in south-central Chile (approximately 39°S). Here, preliminary data suggest mortality of pursuit-diving species such as the Pink-footed and Sooty *Puffinus griseus* Shearwaters, among 13 other species associated with this fishery. In this study, 55.6% of 9 exploratory sets during the austral spring resulted in a mean combined bycatch of 11.4 individuals per set. This was comprised of 81% Pink-footed and 19% Sooty Shearwaters (ATF-Chile unpubl. results). Of course, these first results from ATF-Chile's study must not be considered a final, absolute estimate, since the studies are part of ongoing systematic monitoring. Our monitoring will work towards future bycatch mitigation in the purse seine fishery. We plan to expand our work to additional latitudes along the HCS, add the winter period, and include other species with feeding methods such as plunge diving (e.g. Peruvian booby *Sula variegata*; Table 2).

However, there is a long way to go before we understand the level of negative interactions with seabirds and other taxa in unstudied fisheries. These include trawling for crustaceans in coastal waters and the drift net fishery for swordfish in pelagic waters. For the latter fishery there are past records of marine turtle bycatch since the second part of the 1980s (Frazier and Brito 1990), but there was also unreported mortality of fish, birds, dolphins and whales (Brito in litt.) This fishery operated strongly in central Chile until the end of the 1990s.

New efforts: collective involvement in land-based conservation— Other ongoing efforts include the promotion of citizen engagement to systematically monitor events of beached seabirds along the Chilean coast. The standardized collection of this information will contribute towards the generation of Internet open-access databases, a good example of which is the seabird strandings network (*Red de Varamientos de Aves Marinas*; REVAM). This initiative, born during 2013 in northern Chile, currently has simultaneous monitoring covering the coast between north-central (29°S) and south-central Chile (39°S), with voluntary support of regional representatives (Miranda-Urbina in litt.). Thus, this network compiles information from throughout Chile pertinent to seabird mortality events, likely related to fisheries but also to other causes such as contamination and disease.

Some of these early instances are already materializing as joint projects on topics of seabirds and their interactions with fisheries. These initiatives are of current interest to the national fisheries authority, and also where the collaboration of citizen action along coasts and islands of Chile is expected. Citizens, in turn, are already demonstrating a growing commitment to working with administrators of public protected areas, and they are focused on long-term efforts, such as protection of breeding colonies of the endemic Pink-footed Shearwater.

CONCLUDING REMARKS

Today, the commitment from Chile is progressing towards a better understanding of the level of seabird bycatch, and the generation of strategies to implement effective protection of threatened seabirds. Thus, Chilean participation is active in different international forums, such as the Agreement on the Conservation of Albatrosses and Petrels (ACAP),

with the promotion of new species for listing, such as the Pink-footed Shearwater; the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); and the South Pacific Regional Fisheries Management Organisation (SPRFMO). These organizations facilitate actions by Chile towards the assessment and mitigation of the negative effects of bycatch. And, in turn, our local initiatives can also be externalized to different contexts in international collaboration.

ACKNOWLEDGEMENTS

Our gratitude goes to all the observers working in Chilean waters for their important efforts at sea. Thanks to all artisanal fishermen and crews from fishing companies who openly allowed our work onboard. To Patricio Ortiz Soazo, Jaime Ojeda, Mauricio Steffen, Juan C. González-But, Diego Miranda-Urbina, José L. Brito, Subsecretaría de Pesca y Acuicultura (SUBPESCA), and Instituto de Fomento Pesquero (IFOP) for all their support. We thank Vivian Mendenhall for her invitation, support, and suggestions during the preparation of this contribution. Finally, we thank the time and support of editorial assistance by Sarah Allen and suggestions from two anonymous referees, which improved this contribution.

LITERATURE CITED

Anderson, O.R.J., C.J. Small, J.P. Croxall, E. K. Dunn, B.J. Sullivan, O. Yates, and A. Black. 2011. Global seabird bycatch in longline fisheries. Endangered Species Research 14: 91–106.

ATF (Albatross Task Force). 2007. Albatross Task Force Annual Report 2007. BirdLife International and Royal Society for the Protection of Birds, Sandy, United Kingdom (Contact: C.G. Suazo, biosuazo@gmail.com)

ATF-Chile (Albatross Task Force-Chile). 2013. Demersal Trawl Report (2011–2012). Albatross Task Force-Chile, BirdLife International, Santiago, Chile (Contact: C.G. Suazo, biosuazo@gmail.com)

Azócar, J.R., J.C. Saavedra, P. Barría, Z. Young, R. Vega, C. Moreno, A. García, and M. González. 2010. Fondo de Investigación Pesquera. Proyecto FIP 2008-55: Seguimiento del Plan de Acción de Aves Marinas 2008 (Final Report). Instituto de Fomento Pesquero (IFOP) - Subsecretaría de Pesca y Acuicultura (SUBPESCA). Valparaíso, Chile (www.ifop.cl; accessed 16 June 2014)

Barría, P., J. Azócar, C. Bernal, A. González, S. Mora, F. Cerna, and H. Miranda. 2012. Asesoría integral para la toma de decisiones en Pesca y Acuicultura, 2011. Actividad 1: Recursos Pelágicos. Investigación situación de pesquerías de recursos altamente migratorios, 2011. Final Report. Instituto de Fomento Pesquero (IFOP)—Subsecretaría de Pesca y Acuicultura (SUBPESCA). Valparaíso, Chile (www.ifop.cl; accessed 16 June 2014)

Bartle, J.A. 1991. Incidental capture of seabirds in the New Zealand subantarctic squid trawl fishery, 1990. Bird Conservation International 1: 351–359.

Belkin, I.M. 2009. Rapid warming of large marine ecosystems. Progress in Oceanography 81: 207–213.

BirdLife International. 2004. Tracking ocean wanderers: The global distribution of albatrosses and petrels. Results from the Global Procellariiform Tracking Workshop, 1–5 September 2003, Gordon's Bay, South Africa. BirdLife International, Cambridge, UK.

Brito, J.L. 2002. Muertes de *Puffinus griseus* en redes de pesca de cerco industrial y artesanal en la costa de San Antonio, región de Valparaíso, Chile. Boletín Chileno de Ornitología 9: 33–34.

Brothers, N. 1991. Albatross mortality and associated bait loss in the Japanese fishery in the Southern Ocean. Biological Conservation 55: 255–268.

Cabezas, L.A., J. Ruiz, O. Yates, and M. Bernal. 2012. The black petrel (*Procellaria parkinsoni*) in pelagic waters off northern Chile: a southern extension to the known distribution and interactions with the pelagic longline fishery. New Zealand Journal of Marine and Freshwater Research 46: 537–544.

Cabezas, L.A., and C.G. Suazo. 2011. Chile—Albatross Task Force Team Highlights 2011. Albatross Task Force, BirdLife International and Royal Society for the Protection of Birds, Sandy, United Kingdom. (www.rspb.org.uk; accessed 16 June 2014)

Castilla, J.C., C.A Moreno, and H. Bacigalupo. 2013. Innovaciones en manejo pesquero y conservación en Chile. *In:* Santelices, B., F. Lund, T. Cooper, and J.A. Asenjo (editors). Innovación basada en conocimiento científico. Academia Chilena de Ciencias de Chile y Ministerio de Educación, Santiago, Chile.

Céspedes, R., V. Ojeda, L. Chong, L. Adasme, L. Muñoz, K. Hunt, L. Cid, M. Miranda, and A. Villalón. 2012. Convenio asesoría integral para la toma de decisiones en pesca y acuicultura 2012. Actividad 2: Peces Demersales: Pesquerías de Recursos Demersales y Aguas Profundas 2013. Sección IV: Demersales sur Austral–industrial (Final Report). Instituto de Fomento Pesquero (IFOP)–Subsecretaría de Pesca y Acuicultura (SUBPESCA). Valparaíso, Chile. (Contact: L. Adasme, luis.adasme@ifop.cl)

Croxall, J.P., S.H.M. Butchart, B. Lascelles, A.J. Stattersfield, B. Sullivan, A. Symes, and P. Taylor. 2012. Seabird conservation status, threats and priority actions: a global assessment. Bird Conservation International 22: 1–34.

FAO (United Nations Food and Agriculture Organization). 1999. International Plan of Action for reducing incidental catch of seabirds in longline fisheries. Rome, Italy. (www.fao.org; accessed 16 June 2014)

FAO (United Nations Food and Agriculture Organization). 2008. Report of the expert consultation on best practice technical guidelines for IPOA/NPOA–Seabirds). Bergen Norway, 2-5 September 2008. FAO Fisheries and Aquaculture Report. No. 880. Rome, Italy. (www.fao.org; accessed 16 June 2014)

Frazier, J.G., and J.L. Brito. 1990. Incidental capture of marine turtles by the swordfish fishery at San Antonio, Chile. Marine Turtle Newsletter 49: 8–13.

González, A., R. Vega, M.A. Barbieri, and E. Yáñez. 2012. Determinación de los factores que inciden en la captura incidental de aves marinas en la flota palangrera pelágica chilena. Latin American Journal of Aquatic Research 40: 786–799.

IUCN (International Union for the Conservation of Nature). 2013. IUCN Red List of Threatened Species. Version 2014.1. (www.iucnredlist.org; accessed 16 June 2014).

Moreno, C.A., and J. Arata. 2005. Diseño del plan de acción para mitigar efectos de la pesca de palangre sobre aves marinas. Final Report. Project FIP 2003-21, Subsecretaría de Pesca y Acuicultura

(SUBPESCA). Valdivia, Chile. (www.fip.cl; accessed 16 June 2014

Moreno, C.A., and J. Arata. 2006. Efectos de las pesquerías industriales de palangre sobre aves marinas y el camino a su mitigación en Chile. *In:* Saball, P., M.K. Arroyo, J.C. Castilla, C. Estades, J.M. Ladrón de Guevara, S. Larraín, C.A. Moreno, F. Rivas, J. Rovira, A. Sánchez, and L. Sierralta (editors). Biodiversidad de Chile: Patrimonio y desafíos. Comisión Nacional del Medio Ambiente –Chile (CONAMA–Chile), Santiago, Chile. (www.mma.gob.cl; accessed 16 June 2014)

Moreno, C.A., R. Hucke-Gaete, and J. Arata. 2003. Interacción de la pesquería del bacalao de profundidad con mamíferos y aves marinas. Final Report. Project FIP 2001–31, Subsecretaría de Pesca y Acuicultura (SUBPESCA). Valdivia, Chile. (www.fip.cl; accessed 16 June 2014)

Moreno, C.A., J.A. Arata, P. Rubilar, R. Hucke-Gaete, and G. Robertson. 2006. Artisanal longline fisheries in Southern Chile: lessons to be learned to avoid incidental seabird mortality. Biological Conservation 127: 27–36.

Moreno, C.A., R. Castro, L.J. Mújica, and P. Reyes. 2008. Significant conservation benefits obtained from the use of a new fishing gear in the Chilean Industrial Patagonian Toothfish Fishery. CCAMLR Science 15: 79–91.

Moreno, C.A., and G. Robertson. 2008. ¿Cuántos albatros de ceja negra, *Thalassarche melanophrys* (Temminck, 1828) anidan en Chile? Anales Instituto Patagonia 36: 89–92.

Moreno, C.A., R. Vega, G. Robertson, and G. Luna. 2007. Seguimiento del plan de acción de aves marinas. Final Report. Project FIP 2006-30, Subsecretaría de Pesca y Acuicultura (SUBPESCA). Valdivia, Chile. (www.fip.cl; accessed 16 June 2014)

Ojeda, J., C.G. Suazo, and J.R. Rau. 2011. Ensamble estacional de aves marinas en la pesquería del palangre artesanal de la merluza austral *Merluccius australis*, en canales subantárticos de Chile. Revista de Biología Marina y Oceanografía 46: 443–451.

Österblom, H., A. Constable, and S. Fukumi. 2011. Illegal fishing and the organized crime analogy. Trends in Ecology and Evolution 26: 261–262.

Oyarzún, C., S. Gacitúa, M. Araya, L. Cubillos, R. Galleguillos, C. Pino, G. Aedo, M. Salamanca, M. Pedraza, and J. Lamilla. 2003. Monitoreo de la pesquería artesanal de bacalao de profundidad entre la VIII y XI Regiones. Final Report. Project FIP 2001-16, Subsecretaría de Pesca y Acuicultura (SUBPESCA). Concepción, Chile. (www.fip.cl; accessed 16 June 2014)

Pütz, K., L. Hiriart-Bertrand, A. Simeone, V. Riquelme, R. Reyes-Arriagada, and B. Lüthi. 2011. Entanglement and drowning of a Magellanic Penguin (*Spheniscus magellanicus*) in a gill net recorded by a time-depth recorder in South-Central Chile. Waterbirds 34: 121–125.

Robertson, G., C.A. Moreno, J.A. Arata, S.G. Candy, K. Lawton, J. Valencia, B. Wienecke, R. Kirkwood, P. Taylor, and C.G. Suazo. 2014. Black-browed albatross numbers in Chile increase in response to reduced mortality in fisheries. Biological Conservation 169: 319–333.

Robertson, G., C.A. Moreno, E. Gutiérrez, S.G. Candy, E.F. Melvin, and J.P. Seco Pon. 2008. Line weights of constant mass (and sink rates) for the Spanish-system Patagonian toothfish longline vessels. CCAMLR Science 15: 93-106.

Robertson, G., C.A. Moreno, K. Lawton, J. Arata, J. Valencia, and R. Kirkwood. 2007. An estimate of the population sizes of Black-browed (*Thalassarche melanophrys*) and Grey-headed (*T. chrysostoma*) Albatrosses breeding in the Diego Ramírez Archipelago, Chile. Emu 107: 239–244.

Roe, J.O. 2005. Mitigation trials and recommendations to reduce seabird mortality in the pelagic icefish (*Champsocephalus gunnari*) fishery (Sub-area 48.3). WG-FSA-05/59, SC-CAMLR XXIV. Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), Hobart, Australia. (www.ccamlr.org; accessed 16 June 2014)

Schlatter, R.P., E. Paredes, J. Ulloa, J. Harris, A. Romero, J. Vásquez, A. Lizama, C. Hernández, and A. Simeone. 2009. Mortandad de pingüino de Magallanes (*Spheniscus magellanicus*) en Queule, región de la Araucanía, Chile. Boletín Chileno de Ornitología 15: 78–86.

Schlatter, R.P., and A. Simeone. 1999. Estado del conocimiento y conservación de las aves marinas en mares Chilenos. Estudios Oceanológicos 18: 25–33.

Simeone, A., M. Bernal, and J. Meza. 1999. Incidental mortality of Humboldt Penguins *Spheniscus humboldti* in gill nets, central Chile. Marine Ornithology 27: 157–161.

Spear, L.B., and D.G. Ainley. 2008. The seabird community of the Peru Current, 1980-1995, with comparisons to other eastern boundary currents. Marine Ornithology 36: 125–144.

Suazo, C.G., R.P. Schlatter, A.M. Arriagada, L.A. Cabezas, and J. Ojeda. 2013. Fishermen's perceptions of interactions between seabirds and artisanal fisheries in the Chonos archipelago, Chilean Patagonia. Oryx 47: 184–189.

Sullivan, B.J., P. Brickle, T.A. Reid, D.G. Bone, and D.A.J. Middleton. 2006. Mitigation of seabird mortality on factory trawlers: trials of three devices to reduce warp cable strikes. Polar Biology 29: 745–753.

Trouwborst, A. 2008. Seabird bycatch—deathbed conservation or a precautionary and holistic approach? Journal of International Wildlife Law & Policy 11: 293–333.

Weimerskirch, H., D. Capdeville, and G. Duhamel. 2000. Factors affecting the number and mortality of seabirds attending trawlers and long-liners in the Kerguelen area. Polar Biology 23: 236–249.

Žydelis, R., C. Small, and G. French. 2013. The incidental catch of seabirds in gillnet fisheries: A global review. Biological Conservation 162: 76–88.

This is a peer-reviewed paper.

Submitted 7 April 2013, accepted 8 July 2014; updated through 18 October 2014.

TRANSLATION

BIRDS OF SEODO ISLAND LIGHTHOUSE NORTH KOREA

Nagamichi Kuroda

Originally published as The Birds at Nishi Island Lighthouse in Hwanghae Do, Korea in Tori 3(15): 309-314, 1923.
Translated from the Japanese by Charles H. Pell

Editor's Note: *The PSG Japanese Seabird Conservation Committee asked Charles A. Pell to translate this Japanese article into English to make it more widely available. The article provides some of the earliest information about the breeding of the Ancient Murrelet, Black-tailed Gull, and Streaked Shearwater at Seodo and Suundo islands in the Democratic People's Republic of Korea (DPRK), Chilbaldo Island in the Republic of Korea (ROK), and Eboshi Island in Japan. The reader should be aware that some aspects of biology of these species reported herein have been later interpreted differently with greater subsequent data.* **– Harry Carter**

Translator's Note: *The author provides Japanese names, in use at the time for the geopolitical divisions in which Nishijima, now Seodo Island (also known as Sodo, 西島) lies. These names are no longer used and would not aid the reader in locating the activities described. Hence, they are not included and I have used current Korean place names with latitude and longitude as needed.* **– Charles H. Pell**

My deep gratitude to Mr. Shinsei Hagiwara of the Seodo lighthouse for providing specimens and interesting articles that introduced me to the physical features and habits of the birds of the Seodo Island Lighthouse, Chodo-ri, Nampo City, Hwangnam Province (▪海南道　南浦特別市　椒島里), Democratic People's Republic of Korea (DPRK; North Korea).

The lighthouse is located at 124°46'E longitude, 38°30'N latitude and is 0.9 km northwest of Chodo Island [near the center of the west coast of DPRK, SW of Pyongyang, in the northeastern Yellow Sea. The exact location is 38°33'N, 124°46'E and about 1.4 km from Chodo Island] It is a small island, circumference 763-872 m, that has only one house for the lighthouse staff. The island crest is 84.9 meters above sea level and is a reef formation remaining from a higher mountainous formation. Halfway up the slope weeds begin to grow and there are a few small trees such as cherries.

Four bird species regularly breed on the island, Fork-tailed [Pacific] Swift that was commonly called "Rock Swallow," Ancient Murrelet ("Sea Sparrow"), Black-tailed Gull ("White Gull"), and Streaked Shearwater ("Spotted Gull," "Blackish spotted Gull," or "Black Gull").

1. Fork-tailed [*Pacific*] Swift
Apus pacificus pacificus (Latham)

Migration arrival time: From late March throughout April.

Egg production: Deposition late May to late June. Likelihood of a three-egg clutch is uncertain, but a two-egg clutch is verified from two eggs and two chicks that we received preserved in alcohol.

Nest: Nests are small in size and similar to those of other swallows. They are made of mud, small dust, dry grass inserted into crevices in rocky walls that is stuck together with sticky mucous that hardens to form a cup. Nest size is 106 x 85 mm, 32 mm in depth.

Collected items: Figures 50-52 show photos of Fork-tailed Swift specimens received. They include two adults, one nest, two eggs and chicks described above, collected on May 15 and on June 21, 1922. The two white eggs measured 26 x 18 mm and 27 x 17 mm, and each weighed 4.13 grams.

Habits: This abundant species arrives earlier than the usual swallows and leaves in the fall. It emits a "PYUU" hum as it cuts through the wind, giving the impression of flying faster than other swallows.

2. Ancient Murrelet
Synthliboramphus antiquus (Gmelin)

Migration arrival and breeding habits: Arriving every year in early March, they copulate among the lush grass and rock crevices toward the middle of the month and begin to lay eggs by the end of March or in early April. At this time they place some dry grass into an unmodified depression to form what passes for a nest and begin to lay eggs. Clutch size is usually two eggs but three occur on rare occasions. Every day, adults arrive at the island around dusk and leave the nest early dawn, but once the eggs are laid, they stay on the nest day and night to keep them warm. Incubation time can vary, but seems to take over three weeks. The birds leave the island between mid and late May. Two or three days after hatching the chicks leave the island with the parents, and then swim off to mature on their own. A chick swimming alone was observed. Our specimens included two adults and two eggs collected March 27, 1922. Figure 53 shows a photo of two eggs which are basically earth colored with dark and light variants. The size of egg is relatively large when compared to the size of the female bird. The 62.5 x 38.5 mm and 64 x 39 mm. One of them weighed 49.5 grams.

Note: To Mr. Hagiwara's knowledge, the greatest numbers of this species occur in the vicinity of Chilbaldo Lighthouse, 125°47'E longitude, 34°47'N latitude [*off the SW corner of ROK, W of Mokpo, in the southeastern Yellow Sea*], where the numbers are almost uncountable. In a single day hundreds of eggs can easily be collected. He once made a comforter from the feathers of several thousand parent birds. Bird counts at Seodo Island are much lower, numbering in the hundreds, as is the case in Eboshi Island off Fukuoka in Japan [*latitude 33°41'N, longitude 129°59'E, off the NW coast of Kyushu, in Tsushima Strait*], a reef island that also has a lighthouse, where Hagiwara saw only 10s of birds coming ashore to nest. Both islands are small with circumferences of less than 763-872 [*Seodo*] and 2,000 m [*Eboshi*].

[*Only Japanese Murrelets (*S. wumizusume*) subsequently have been found breeding at Eboshi Island (Nagata and Onagamitsu 1991). K. Otsuki and M. Takeishi suggested that Hagiwara likely misidentified the species of murrelet that bred at Eboshi Island*.]

3. Black-tailed Gull
Larus crassirostris (Vieillot)

Arrival time and breeding habits: Gathering on the sea surface in a noisy flock every day at dawn from the beginning of April, they move ashore when beginning to copulate. After the mid April copulation period they lay eggs from the beginning of May to early June. After mating takes place at the edge of the rocks they stay together day and night. The gulls appear to cast a white mantle over the whole island from mating time until the chicks fledge, but only a few can be seen in the water near shore at other times of year, namely between September and March when they move elsewhere. Males stand guard while the females are brooding eggs. This likely shows monogamy, but there are so many of them that it is difficult to determine when viewing them which male goes with which female.

Nesting: In a little dead grass placed in a depression in the rocks or on the grassy surface without actually forming a nest, they deposit a clutch that can number three eggs but more likely two. Time between the laying of the first and next egg can be greater than five or six days, even up to ten days. Hatching of the eggs does not take place as a one-time event, as is the case with some birds, resulting in size difference between early and late hatched siblings in the same nest. Three out of six donated eggs measured 65.5 to 68.5 x 44 to 45.5 mm. Two eggs weighed 65.6 grams and the other 69.4 grams.

Chicks: Grown chicks fledge between the beginning of June and late August. Until that time the parents bring food to them. The food includes small clupeid fish and small squid.

Sexual dimorphism: Male weight and body length are just slightly greater, hardly noticeable to the eye.

Collected Items: Figure 55 shows a photo of specimens of three chicks at different stages of development. Other specimens not shown in the photo included two pairs, three chicks, and six eggs. These were collected May 15 and June 21, 1922.

Notes: Hemp line foot snares were set up on the sharp rocks ahead of time and pulled from a distance. Because of many thousands of birds, it was relatively easy to catch Black-tailed Gulls. Black-tailed Gulls (commonly called "White Gull") come out and lay eggs in the daylight and sleep at night, but can be heard calling on moonlit nights. Streaked Shearwaters also have the common name "Spotted Gull," and come out only at night, keeping to their burrows in the daytime when they are not visible. Hence the Black-tailed Gulls are locally called "day gulls" and the Streaked Shearwaters "night gulls."

4. Streaked Shearwater
Puffinus leucomelas (Temminck)

Migration Arrival Time, etc: Migrating birds begin to arrive during the last part of March and either dig a horizontal burrow in a bank or enter an existing opening between rocks. Egg deposition occurs between late June and early July. Copulation may take place in the burrows or away from the breeding site, but details are uncertain. Females simply deposit the eggs in the burrow or rock crevice without building a nest structure. It was not like the so-called nest. The clutch is limited to a single smooth white egg. The egg yolk is light yellow in color and the white is colorless and transparent.

Chicks: After hatching, parents provide small clupeid fish or small squid as food for the chicks. Similar to the approach used by cormorants, the parents carry food back in their gullets and regurgitate it when they return to the nest. During the heat (around August) chicks crawl out from the nest entrance but retreat back to safety at the sound of a footstep or sight of a human figure. They fledge about the middle of October and by the end of the month have matured and departed from the nest area.

Habits: Around sunset the shearwaters gather on the sea surface, playfully interacting near shore, taking off and landing on the island or noisily visiting the burrows. Just 20-30 minutes before dawn they take off and fly away, with not one bird remaining after daylight. During incubation the parents remain together on the island day and night. This makes the females easy to catch, but the males are more difficult. People club the birds to death at night. These birds skillfully glide through the air performing loop maneuvers like those of swallows. When they try to take off from land, however, they must fly parallel to the surface like an airplane for some distance before they can gain altitude. On the lighthouse

grounds a one and a half meter high concrete wall encloses an area that is easy for birds to enter during the night. Lacking a sufficiently long horizontal runway (12.7-14.5 m) they cannot get out, however, being unable to fly up diagonally. The birds will bite anyone who sticks a hand into the burrow to try to take an egg away from under an incubating bird. To counter this, people use a looped-string with a diameter of 9 cm attached to a bamboo stick, or alternatively use a bear paw shaped rake to scrape the egg out of the hole. [*M. Takeishi suggested that the original paper must have had a typographical error where* 玉綱 *(ball rope or looped string) should have been* 玉網 *(dip-net) and this sentence should read as: To counter this, people use a net with a diameter of 9 cm attached to a bamboo stick… H. Carter suggested that the net or rake apparently was used to roll or drag the whole egg out of the burrow.*]

Quick hand work is required to get the egg before the bird breaks the egg after becoming very angry. The clutch is limited to a single egg. After the egg is laid, incubation starts. It is very rare to find the egg unattended in the nest because a parent is almost always tending to incubation duty. Specimens received were one adult and two eggs collected June 21, 1922. The two eggs measured 68.5 x 45 mm and 72.5 x 45.5 mm and one of them weighed 73.88 g (Fig. 54).

Notes: Many Streaked Shearwaters come to nest at Chilbaldo, but no Black-tailed Gulls. At Seodo, there are many more Black-tailed Gulls than Streaked Shearwaters, and rarely "ahodori" that are known locally as "Rat Gulls," also come.

[*H. Hasegawa and C-Y. Choi suggested that "ahodori" appears to be a local name for a species which cannot be identified.*]

There is information that there are abundant "Rat Gulls" at another lighthouse at Suundo, Cheolsan-gun, Pyeongbuk Province (Pyeonganbuk-do), which is located near the Yalu River Estuary between the People's Republic of China (China) and DPRK [latitude 39°41'N, longitude 124°25'E; Suundo is in DPRK in Korea Bay at the northeast end of the Yellow Sea]. These three species of course have their own criteria for choosing places to inhabit, but here we have one place to the south [Chilbaldo – at south end of the Yellow Sea] that attracts Streaked Shearwater ("Black Gull"), one place in the middle [Seodo – between Chilbaldo and Suundo but much closer to Suundo] is used by all three species with Black-tailed Gulls being more numerous at one and less at the other, and then there is a place further north [Suundo – at north end of the Yellow Sea] where the so-called "Rat Gulls" land. Mr. Hagiwara questions whether climate is a factor in these distributions.

ACKNOWLEDGEMENTS

K. Otsuki, M. Takeishi, C-Y. Choi, H-Y. Nam, H. Hasegawa and H. Carter assisted aspects of this translation.

LITERATURE CITED

Nagata, H., and J. Onagamitsu. 1991. Rediscovery of a breeding population of the Japanese Murrelet *Synthliboramphus wumizusume* on Eboshi-jima Island in the Sea of Genkai, Kyushu. Strix 10: 259-262.

APPENDIX

The following information was provided by Chang-Yong Choi and Hyun-Young Nam:

西島 **Seodo** (朝鮮黄海道)

There has been a light house here since 1908. The Island must be "SEODO (西島)" which belongs to Chodo-ri, Nampo City, Hwangnam Province (▪ 海南道 南浦特別市 椒島里).

The old spelling code for Korean-Roman translation, SODO would be accepted as well before the 1990s (and is commonly used at present in DPRK). Although the current code spells it 'Seodo', DPRK may use a different (old) rule for Romanization.

水運島 **Suundo** (平安北道鴨緑江沖合)

"The light house at Suundo (水運島) Island, Cheolsan-gun, Pyeongbuk Province (Pyeonganbuk-do), which is located near the Yalu River Estuary between China and DPRK."

This area belonged to Ihyun-ri or Sosa-ri, Punghae-myeon, Songhwa-gun, Hwanghae Province (▪ 海道 松禾郡 豊海面 泥峴里/蘇沙里) before 1950s, and to Chodo-ri, Gwail-gun, Hwangnam Province (▪ 海南道 과일郡 椒島里) until 1996.

SUGGESTED CITATION

Kuroda, N. 2014. [Birds of Seodo Island lighthouse North Korea.] Pacific Seabirds 41: 13-17 (English translation by Charles A. Pell of a 1923 article published in Japanese).

第五十圖　　アマツバメの巢　（二分の一强實物大）

Figure 50. Fork-tailed Swift nest – half actual size [*Sizes mentioned in figure captions refer to the original article*.]

第五十一圖　　アマツバメの卵
（約實物大少しく縮少）

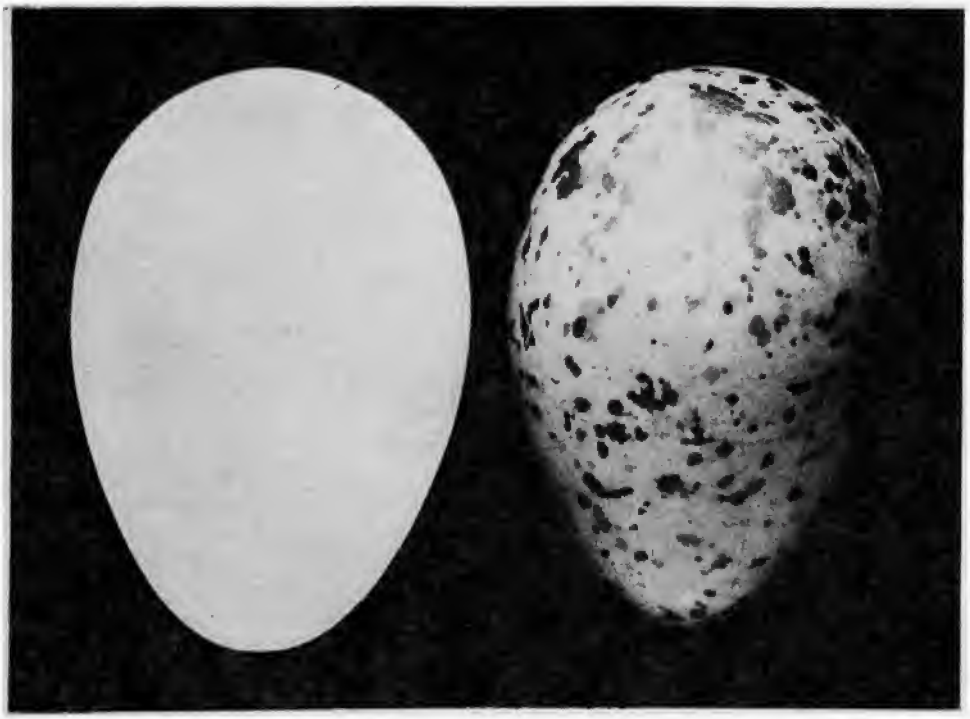
Figure 51. Fork-tailed Swift eggs – slight reduction from actual size.

第五十二圖　アマツバメの雛
（實物大）

Figure 52. Fork-tailed Swift chick – actual size.

第五十三圖　　ウミスヾメの卵　　（約實物大）
向つて左淡色　　右暗色

Figure 53. Ancient Murrelet eggs – about actual size. Light color variant on left, dark on right.



第五十四圖　向つて右ウミネコの卵　向つて左オホミズナギドリの卵

Figure 54. Streaked Shearwater egg on Left, Black-tailed Gull egg on right.

第五十五圖　ウミネコの雛（凡て縮少）
向つて右より 1 孵化後凡三乃至四日
2 〃 〃 〃 一週間
3 〃 〃 〃 三週間

Figure 55. Black-tailed Gull chicks – less than actual size. From Right: 1. About 3 or 4 day old chick; 2. About 1 week old chick; 3. About 3 week old chick.

LIFETIME ACHIEVEMENT AWARD

The Pacific Seabird Group occasionally honors major contributors to seabird science and conservation with Lifetime Achievement or Special Achievement awards. The Lifetime Achievement Award recognizes an individual whose outstanding work for seabirds has influenced the course of research, conservation, and/or education throughout the Pacific or the world. At the 41st Annual Meeting in Juneau, Alaska, in February 2014, PSG presented the Lifetime Achievement Award to Dr. Anthony J. Gaston. Tony could not attend in person, but he received his award via video link. The award was presented in Juneau by Julia Parrish; the tribute to Tony published here was written by Jo Smith and others.

DR. ANTHONY J. GASTON

Joanna Smith, with assistance from Mark Rauzon and other PSG former Chairs and contributions from Tony's friends and colleagues: Alan Burger, Christine Eberl, Kyle Elliott, Mark Hipfner, Andrea Lawrence, Jean-Louis Martin, and Keith Moore

The Pacific Seabird Group honored Dr. Anthony J. Gaston with a Lifetime Achievement Award in 2014. For nearly thirty years, Tony has been a leader and participant in the Pacific Seabird Group, presenting his research on the ecology of seabirds for Environment Canada and inspiring members young and old in the conservation and study of seabirds. A bird-bander since the age of 11, Tony is interested in all facets of ornithology. He has made significant contributions to our understanding of seabird demography and how bird populations are affected by large-scale oceanographic and climatic trends. His research program includes analysis of population dynamics of marine birds in the Eastern Canadian Arctic and Haida Gwaii, as well as the impact of introduced mammals on ecosystem components. Tony specializes in studying birds in locations that other ornithologists seldom access. Tony was born in Croydon, England, a town just south of London. Few PSG members know that Tony's career began in anthropology, searching for fossil hominids in India. After his B.A. in Physical Anthropology at Clare College, University of Cambridge, UK, he participated in several anthropological expeditions in India, Iran, and Pakistan from 1969-1975. Tony completed his Ph.D. in Zoology at Oriel College at the University of Oxford UK from 1970-1976, supporting himself on contracts including as a stage manager of a traveling dance company with his wife Anne-Marie. His Ph.D. program began with David Lack (who died), and was completed with Chris Perrins, both renowned ecologists. Afterwards, he established and directed the Himachal Wildlife Project (1979) and undertook wildlife surveys in Himachal Pradesh, India. Tony's involvement with Environment Canada began with short-term contract work (1975-1977) that evolved into full-time employment from 1980 until his retirement in April 2014. Tony's career includes not one, not two, but three impressive long-term studies in three geographic regions of the world: the Eastern Canadian Arctic, Northeast Pacific Ocean, and Northwest Himalayas. These studies have allowed Tony to examine demographic questions, climate change effects, Himalayan ecology, and the impacts of introduced mammals at temporal and spatial scales seldom matched by others. Tony's career in the Eastern Canadian Arctic began in 1975. His research on Thick-billed Murres (*Uria lomvia*) and others seabirds has taken place every year and on no fewer than nine colonies: Prince Leopold Island, Coburg Island, Hantzsch Island, The Minarets, Cumberland Peninsula, Baillarge Bay, Coats Island, Digges Island, and Akpatok Island. In 1981, Tony co-wrote a book with David N. Nettleship titled The Thick-billed Murres of Prince Leopold Island (Canadian Wildlife Service). Tony's research on arctic seabirds is extraordinary; it is dangerous work, on steep cliffs, and it has yielded enormous insights.

The Pacific Seabird Group honored Dr. Anthony J. Gaston (pictured here on Coats Island) with a Lifetime Achievement Award in 2014. Photo: Leah de Forest

"More than anyone, you, Tony have championed the effort to establish an international standard of excellence in the study of murres....Your life's effort and legacy is reflective of an uncommon path well-travelled. Yours is an experiential, process-oriented trek that has opened avenues and vistas for so many others both directly and indirectly." Bill Montevecchi, 2014.

In 1984, he initiated what would become a multi-decadal research program on the Ancient Murrelet (*Synthliboramphus antiquus*) on Reef Island, Haida Gwaii, British Columbia. With his students and others, Tony has conducted detailed studies of banded individuals and nest sites to provide the essential ecological and demographic data for understanding and managing

Giving a lecture in the field, Reef Island, Haidi Gwaii. Photo: Jean-Louis Martin

this species. His research on Ancient Murrelets was truly groundbreaking and remains the role model for studies of burrowing alcids. Tony established nest boxes for the murrelets on Reef and Limestone Islands, creating a unique set-up to study this notoriously skittish species. His 1992 book, The Ancient Murrelet: a Natural History in the Queen Charlotte Islands (T & A.D. Poyser) is a wonderful example of clearly explained science and is a must-read for aspiring alcid biologists. Tony is the Research Director of the Laskeek Bay Conservation Society (LBCS), a non-profit society that was founded in 1990 to provide research and education opportunities for local people and visitors as volunteers in long-term monitoring of Ancient Murrelets in Laskeek Bay. For the last 24 years, Tony has been a major force on Haida Gwaii, and as a result Ancient Murrelets are part of the community profile now. Tony inspired many field biologists that worked with LBCS to a career in ornithology or marine sciences, including the current PSG Chair, Jo Smith.

"One summer, I was working on Limestone Island to study the Ancient Murrelets with Tony, and was asked to assist Steve Stockton, a student of Tony's, with his plant research, by taking him among the islands using our zodiac. One day, on a return trip from Kingsway Rock, we found ourselves in thick fog. After what seemed like the longest run ever back to Reef Island, we found ourselves only a few 10s of metres from our point (on Reef Island). Tony and Jean-Louis Martin were there to greet us. ...Tony, as always, with binoculars around his neck, was probably far more interested in what he could spot in terms of seabirds in this thick fog but was nevertheless impressed we had made it back in one piece." Jo Smith (for Lifetime Award Presentation in Juneau, February 2014)

In 1997, Tony expanded the research on Haida Gwaii to include the impact of introduced Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) on the island ecosystems and the phylogenetic affiliation of the endemic races of landbirds in the archipelago. Serendipity brought Tony and Dr. Jean-Louis Martin (CNRS, Montpellier, France) together, a collaboration that led to the Research Group on Introduced Species (RGIS), a non-profit that specialized in the impacts of introduced mammals on Haida Gwaii ecosystems. Tony and Jean-Louis were pioneers on Haida Gwaii, quantifying the ecological effects of deer on the terrestrial ecosystem and engaging with members of the scientific and local community to explore the controversial topic of deer management on the archipelago and develop solutions. RGIS research resulted in deer culls on two islands: Reef Island and the UNESCO World Heritage Site at SGang Gwaay.

Tony regularly attends the PSG annual meetings and is an important advisor to the Executive Council. He has inspired, impressed, and amused members with his numerous presentations and contributions. Who can forget the PSG meeting when Tony, the auctioneer, literally sold the shirt off his back (a desirable t-shirt)? Some highlights include a plenary presentation in 1997 titled "Age and Experience as Factors in Seabird Breeding Success: Lessons from the Thick-billed Murre," a Special Paper Session in 1995 on "Coloniality and Seabird Population Dynamics," and the only member to write a rap song for his presentation! In 2007, Tony convened a special meeting of PSG in Taiwan. From 1999-2012, Tony was the Editor-in-Chief for Marine Ornithology. Along with the late Steve Speich, he shepherded the journal's transition to PSG management in 1999. Under Tony's editorial guidance the journal began attracting a fully international authorship and readership.

Taking in the view in Akpait National Wildlife Area, Baffin Island. Photo: Garry Donaldson

Tony remains as the Managing Editor for the journal, overseeing production and subscriptions.

The editor of Marine Ornithology, *scholar, and poet, safely behind his desk. Photo: Jean-Louis Martin*

Tony's passion for seabirds and natural history is infectious and many students are deeply grateful for Tony's mentorship and guidance. Tony has supervised or co-supervised 11 M.Sc. students and six Ph.D. students in Canada, plus three students overseas. He is an Adjunct Professor in the Department of Biology at Queen's University in Kingston, Ontario and has contributed to graduate student committees at Carleton University, Memorial University of Newfoundland, and University of Manitoba. The Pacific Seabird Group has seen few members that have had the same long-lasting and positive impact; at every meeting, scores of students seek out Tony for advice and comments on their research projects.

"I can honestly say that I owe my career to Tony...he took a chance on a serially underemployed 30-year-old with no math skills, no computer skills, and a mediocre academic track. He taught me an awful lot, without ever having to say very much at all. To this day, I consider Tony to be the finest field biologist and natural historian I have worked with." Mark Hipfner (for Lifetime Award Presentation in Juneau, February 2014)

Tony was recently recognized by the Society of Canadian Ornithologists for his contributions, receiving the Doris Huestis Spiers Award for outstanding contributions to Canadian ornithology in 2006, and the Jamie Smith Memorial Mentoring Award for outstanding contributions in mentoring in 2013.

"He does not have dozens of students in his lab, but rather one or two at a time, and has ample time and energy available to mentor each student...his enthusiasm is contagious. Tony has had a strong influence on many students... [he] has never been formally involved in my graduate career – yet he has been a better mentor than any of my graduate supervisors." Kyle Elliott (nomination letter for the Jamie Smith Mentoring Award)

Tony has an impressive publication record, with 196 peer-reviewed papers (130 of these on marine birds) and four books on marine birds including three scientific monographs (the two mentioned above and Bird Families of the World - The Auks: Alcidae with Ian L. Jones; Oxford University Press 1998) and a popular account of seabird biology Seabirds: A Natural History (Yale, 2004). Bob Furness had this to say in his review of this book:

"Tony indicates the book is aimed primarily at the interested novice... but I would enthusiastically encourage you to read it... many of the points raised are ones that I certainly had not been thinking about... So now I'm wondering whether I'm just narrow-minded, or whether Tony Gaston has an exceptionally fertile mind." Bob Furness, 2004, on Seabirds: A Natural History.

Throughout his ornithological career, Tony has maintained his connections to India with research that has especially focused on the temperate and alpine regions of the northwestern Himalayas, an area he has visited for 35 years. He has been a Senior Consultant on forestry and wildlife for the World Bank (1991-92) as well as held two international consultancies on high altitude wildlife and ecosystem monitoring with the Wildlife Institute of India (World Bank 1994 and UN FAO 1997). Tony was involved in the creation of the Greater Himalayan National Park, now a UNESCO World Heritage Site.

Tony is truly a multi-dimensional performer; he is a published poet and, as narrator for dance performances, he regularly collaborated with his wife Anne-Marie (well known as Anjali, the classical Indian dancer). In 2013, he co-authored with Anne-Marie the chapter on Dance for the Oxford Handbook of Religion and the Arts, Oxford University Press.

In closing, it is with pride that the Pacific Seabird Group honors Dr. Anthony J. Gaston with the 2014 Lifetime Achievement Award. In February of this year, we had the pleasure of presenting the award via video-conferencing from the Centennial Hall in Juneau, Alaska to his home in Ottawa, Ontario. Following Dr. Julia Parrish's enthusiastic and amusing presentation, the audience gave Tony a standing ovation as he was presented the award virtually. Tony responded in true Tony fashion - by sharing a wonderful poem that he had written, providing several humorous comments and anecdotes, correcting Julia's mistakes, and humbly accepting this honor bestowed upon him by his peers and colleagues at the Pacific Seabird Group.

In his element on Prince Leopold Island. (Photographer unknown; used by permission of A.J. Gaston)

SPECIAL ACHIEVEMENT AWARD

The Pacific Seabird Group occasionally honors outstanding contributors to seabird science and conservation with a Special Achievement Award. At the 41st Annual Meeting in Juneau, Alaska, in February 2014, PSG presented the Special Achievement Award to Vivian Mendenhall. The transcript of Pat Baird's tribute to Vivian in Juneau appears, in slightly edited form, below.

VIVIAN MENDENHALL

Pat Baird

Vivian has been a member of PSG since 1986, was PSG secretary for four years, and served as editor of *Pacific Seabirds* for 14 years. She continued the work started by her predecessor, Steve Speich, to raise the publication from a newsletter and summary of summer research into a refereed journal that was carried by about 30 libraries at the height of the hard-copy journal era. Vivian has been an ex-officio member of PSG's Board, the Executive Council, or EXCO, for 14 years, contributing much via rewrites of the bylaws, archiving various documents, and of course, being our Parliamentarian. She has also conducted research on seabirds since the 1970s through the present, often volunteering on projects worldwide. She was Marine Birds Coordinator for the US Fish and Wildlife Service's Alaska Region. She was manager of the USFWS Seabird Colony Database from 1986 to 1998, during which time she actively sought updated colony data and initiated new surveys. She also was on a planning team for the North Pacific Fisheries Management Council, and conducted cooperative research with colleagues in Russia. Although she has not been presenting her research on seabirds since her retirement from USFWS in 1998, in previous years she was a regular contributor to the papers sessions of PSG's annual meeting. I would like to begin this presentation by reading a poem by Dag Hammarskjöld. This poem was the first poem he wrote, and was found after his death, along with many others. These were later published posthumously under the title Markings. Dag, for those of you who are younger, was the second Secretary General of the United Nations and held this position from 1953- 1961.

THUS IT WAS 1925
I am being driven forward
Into an unknown land.
The pass grows steeper,
The air colder and sharper.
A wind from my unknown goal
Stirs the strings
Of expectation.
Still the question:
Shall I ever get there?
There where life resounds,
A clear pure note
In the silence.

Vivian Mendenhall checking Ancient Murrelet burrows on Talan Island, Russia, in 1994.

Who is Vivian Mendenhall? I think of her as the mild-mannered Clark Kent who dressed in conservative clothes and who was always diligently working in the background as the "mild-mannered reporter," but who also was the complete opposite and who did amazing things. You all may think of Vivian as Clark Kent too—diligently editing all the draft reports and manuscripts that came her way as editor of *Pacific Seabirds*: stuck behind a computer with her red markers, cutting and pasting. However, there is a different side. I have had the pleasure, as Associate Editor of *Pacific Seabirds* in 2012 and 2013, to get to know Vivian. Within our usual editorial back and forth emails or phone calls, would occasionally pop up a throw-away comment from her such as "when I was white-water kayaking," or "when I was rock climbing," or "when I was flying airplanes…"

Yes, that is our Vivian: tirelessly working in a bland government cubicle, data crunching, or as most of you know her, cryptically slogging away at the thankless job of editor of *Pacific Seabirds*. However, in her other life she is a Beryl Markham, a Vita Sackville-West, a Liz Robbins, or a Claire O'Hara, perennially pushing the limits, testing herself, living life to the fullest. A first child, born in Birmingham Alabama, she moved to Pasadena California before she was two years old. Vivian was no ordinary stay-at-home-with-dolls girl, and her joy in nature began at an early age. She was lucky to have parents who were climbers and back-country skiers. This was unusual in the 1940s, and as Vivian said, "they were

Four-wheelin'! St. Paul Island, Alaska, 1995.

probably considered exotic and crazy." Vivian adopted climbing at six years of age – without a harness. She also skied at an early age, and often fished and contemplated nature. She climbed trees or played Huck Finn when she found an abandoned raft (her first at-sea experience). She climbed in the Sierras with her sister, or backpacked in the Sierras and the Cascades with her family in the years before light internal frame packs. Vivian had an early interest in birds and science. She started birding at age 11. She also was an early adopter of good editing skills. Her mother was a journalism major, had her kids diagram sentences, and often corrected their English.

Vivian went on to college at UCLA where she produced an honours thesis on spermatogenesis in the House Finch while she continued to hike, climb, and occasionally cave. After her junior year she went to Austria where she discovered kayaking. It was at the University of California, Berkeley where her ties with marine birds started, and her thesis was on the Feeding Ecology and Behavior of the Willet. Vivian moved to Alaska in 1969, keeping in line with her spirit of adventure, and worked at the University of Alaska, Fairbanks where she lived in a 12-foot square cabin and got into cross country skiing. Vivian always does things to the max, and so she went on a week's ski expedition in the Brooks Range during this time. She also had her first experience in the bush between Nome and Point Hope during this time. In her spare time, Vivian kayaked down the Alsek River from Haines Junction, Yukon territory, to the Alaska coast (140 miles). The Alsek is rated as one of the most celebrated whitewater rivers in the world, and is part of the legendary Triple Crown of North American Whitewater class V+ big-water runs. On this trip, Vivian portaged 10 miles across a glacier. This is the Vivian that most PSG members do not know: adventurer, climber, mountaineer, kayaker.

Vivian decided to go on for her Ph.D., and this time she chose the University of Aberdeen in Scotland, where she worked at the Culterty Field Station and studied the fledging success of Common Eiders on the River Eyethen estuary. Her dissertation was titled "Growth and mortality factors of Eider ducklings in north-east Scotland." Even in Scotland Vivian still found time to hike during the summer and winter. Since her life was not filled enough, she learned Gaelic and Scottish history during her time there. Then the job search started, and she finally found a position at Patuxent Wildlife Research Center—after her application was first rejected because her brain had flat-lined as she incorrectly answered the yes/no questions on the Standard Form 171 ("Are you a US citizen," "Are you a member of the Communist party," and "Have you ever been convicted of a crime"). She remedied that and was put to work in the contaminant section and later in the Brown Pelican project where she monitored their success in South Carolina and Florida. She also conducted experiments on Barn Owls using DDT, dieldrin, and rodenticides.

Happily, Vivian found that the east coast also had an outdoors, and she continued climbing and skiing, although she returned to the west to continue mountaineering. After a brief stint in Australia, in 1980 she landed a job with the USFWS Refuge System in Alaska where she was on a planning team for the Alaska Maritime Refuges, and where she was thrown together again with seabirds. From there she moved on to a new position of Marine Bird Coordinator, unfortunately mostly desk work and editing. Always restless to return to the field, she convinced her bosses that she needed to help in monitoring studies so she would know what the biologists were talking about. So she went to St. George and St. Paul Island, where she worked on shearwaters and kittiwakes. Vivian eventually took over Art Sowl's Seabird Colony Database. During this time, she served on a planning team for the North Pacific Fisheries Management Council and taught classes for fisheries observers on identifying seabirds. Some of those students went on to study seabirds. An especially rewarding part of her job was cooperating with colleagues in the Russian Far East in Magadan in 1989 and on Talan Island in 1994.

In 1998, the USFWS offered early retirement, and Vivian took it. This gave her time to accept (in 2000) the volunteer job of editor of *Pacific Seabirds* and to bring that publication up to her mom's journalism standards. She has loved the job because she has been able to interact with seabirders from all over the planet. She learned desk-top publishing, graphic arts, copy-editing and executive

editing while editor, all of which skills helped to launch the journal into another league. Besides that job, she served as Secretary on PSG's ExCo for four years. Vivian found volunteering for PSG very rewarding. Vivian has been instrumental in helping to write new bylaws for PSG, and has been the much-needed PSG Parliamentarian (really: who else can remember all those Roberts Rules of Order?). She has also been a life-saver for the archival memory of PSG.

In retirement, Vivian has kept busy volunteering for other organizations in addition to PSG. She is on the board of Anchorage Audubon as well as other NGOs, has commented on draft EISs, and has testified on habitat conservation before municipal governments. Always eager to get back out into the field, Vivian has volunteered on a number of seabird surveys. Vivian was the staff seabird expert on the "Harriman Revisited Expedition" in 2001 from Homer along the Alaskan peninsula, into the Bering Sea, and over to Far East Russia. Never one to rest on her laurels, she started a local research project in Anchorage recently on incubation behavior in Sandhill Cranes and their responses to disturbance in the Coastal Wildlife State Refuge.

Vivian still hikes and does eco-tours with her husband in places like China and Tanzania, Galapagos, the Amazon, Antarctica, and the Falkland Islands. Her most rewarding bird experiences have been not just with seabirds like penguins but also finding the Black Woodpecker in France and Snow's Guillemot in the Kurile Islands. In recent years, Vivian also has indulged her love of music and joined the Anchorage Opera. But that was not enough. She has always liked folk dancing, and so now she leads a Scottish Country Dancing group. She and her husband Jim still visit their salmon set net site in southwestern Alaska (Nushagak Bay) but they no longer fish there.

Vivian has always believed in volunteering, whether for PSG or for other groups, and her many contributions to PSG over the years have greatly improved our society. I am encouraging her to become our first appointed Archivist. Vivian has been active in the natural world from the time she was a toddler, and we are lucky to have had someone with so much knowledge and experience be a part of our group all of these years.

I started with the first poem ever written by Dag Hammarskjöld, and I will close with his final poem, written August 24th, 1961 (his plane was shot down over Africa on 18 September 1961).

[UNTITLED]
Is this a new land,
in a different reality
from today's?
Or have I lived there
before this day?
Woke up,
an ordinary day with grey light
reflected from the street,
woke up –
from a sombre blue night
above the tree line
moonlight on the moor
the mountain ridge in shadow.
Remembered
different dreams,
remembered
the same mountain landscape:
twice did I climb the ridges,
I lived by the inmost lake
and followed the river
towards its source.
The seasons have passed
and the light
and the weather
and the hour.
But it is the same land.
And I am beginning to know the map
and the points of the compass.

It's been a good run for Vivian—28 years isn't bad. Sincere and heartfelt thanks to her for her service to PSG, contributions to seabird biology, and her friendship.

In the Anchorage Opera Chorus for the performance of Eugene Onegin, 2010.

FORUM

Pacific Seabirds encourages submission of opinion columns on seabird science and conservation and related topics. Forum authors are expressing their opinions, not those of PSG or the editors. Alternate viewpoints are welcome, and may be published in subsequent issues.

Seabirds and Fisheries

W.R.P. Bourne

People interested in seabirds tend to attach a high ecological importance to them. For example, in a commentary on a Scottish National Heritage Trend Note on "Biodiversity: Seabirds in Scotland" describing recent local seabird declines, Miles (2013) states "Seabird monitoring gives a rare insight into the state of ocean habitats and marine ecological communities, because in terms of marine food chains seabirds sit right at the top of the card house...." The trouble with this popular belief is that seabirds are by no means at the top of the marine ecological web, which is occupied by fish and mammals; seabirds occur only on the periphery. This helps explain their present fortunes in many parts of the world. For example, in the British Isles in the nineteenth century, both marine birds and mammals were heavily exploited, but there were apparently plenty of fish. Since then the birds and mammals have been protected, and it is the fish that have been over-exploited. The removal of large fish results in a proliferation of the small fish which they, and birds, eat (Bourne, 1982), so in the 20th century British seabirds had a ball. Now that fisheries are beginning to be better-managed (Fernandez and Cook 2013) it is hardly surprising that some seabirds are doing less well.

Certain events become explicable in the light of this. In the middle of the last century there were a number of British seabird disasters, both when aquatic-dependent species were in molt in the late summer, and during the winter, attributed at the time to pollution, though these disasters were usually precipitated by bad weather (Bourne 1976). Nobody questioned seabird productivity at that time, and in retrospect it may be wondered if the decline in numbers was a consequence of over-population. Now we hear of fewer and smaller disasters, but there is more concern about breeding success. The weather again appears to be an important factor, but there also appears to be a failure of food supplies. Can it be that these are now being consumed by larger fish again (Bourne 2012, Smout and Stewart 2013)? This problem should have been dealt with by the late Roger Bailey, an ornithologist in charge of ICES NW European fishery statistics, but sadly he was unable to complete his book on the ecology of seabirds. Meanwhile, improvements in the management of fisheries to return to a more natural state in the sea may be bad for seabirds.

– Ardgath, Station Road, Dufftown, Keith, Scotland; wrpbourne82@yahoo.co.uk

REFERENCES

Bourne, W.R.P. 1976. Seabirds and pollution. Pages 403-502 in Johnston, R.(Ed.) Marine Pollution, London, Academic Press.

Bourne, W.R.P. 1982. Concentrations of Scottish seabirds vulnerable to oil pollution. Marine Pollution Bulletin 13: 270-273.

Bourne, W.R.P. 2012. Seabirds' diet. The Times 30th August 2012.

Fernandez, P.G. and R.M. Cook 2013. Reversal of fish stock decline in the northeast Atlantic. Current Biology 23: DOI.

Miles, W.T.S. 2013. Long-term declines in Scottish seabird populations. Scottish Birds 33: 145-152.

Smout, T.C. and M. Stewart 2013. The Firth of Forth: an environmental history. Edinburgh, Birlinn.

CONSERVATION REPORT

Compiled by Stan Senner

REDUCING AVIAN PREDATION ON SALMON

Lethal Control of Double-crested Cormorants: For nearly 15 years now the U.S. Army Corps of Engineers (USACE) has been concerned about avian predation on salmon smolts in the Columbia River system, including at East Sand Island in the Columbia River estuary. Concern about avian predation on juvenile salmon and steelhead—some from stocks listed under the Endangered Species Act—focused initially on Caspian Terns (*Hydroprogne caspia*), but more recently has also included Double-crested Cormorants (*Phalacrocorax auritus*). The world's largest colony of Caspian Terns and the largest colony in the Western US of Double-crested Cormorants are found on East Sand Island, where the seabirds are attracted

by nesting habitat on an island enhanced by the previous disposal of dredge spoils by the USACE and by the presence of hundreds of millions of wild and hatchery-reared out-migrating smolts.

In June 2014, the USACE and several cooperating agencies, including the U.S. Fish and Wildlife Service, released a Draft Environmental Impact Statement (DEIS) containing management options to reduce avian predation on Columbia River salmonids. Alternative C, the preferred alternative in the DEIS, proposed killing 16,000 Double-crested Cormorants over a two- to four-year period. Almost 30,000 Double-crested Cormorants nested on East Sand Island in 2013, so the USACE has proposed to shoot (with rifles) more than half of the cormorants nesting there. The proposed lethal control at East Sand Island amounts to more than 25 percent of the population in western North America.

In a letter of public comment submitted in August, PSG opposed the USACE's Preferred Alternative C because (1) the science documenting the need to reduce avian predation and the resulting benefits to salmon smolt survival (and returning adults) is weak, (2) non-lethal control has not been fully tested and evaluated prior to the proposed lethal control, and (3) the impact of the preferred alternative on the western North American population of Double-crested Cormorants is a serious concern. For its part, the USACE is interested in reducing any source of mortality to out-migrating smolts and believes that non-lethal controls either won't work or will simply disperse the cormorants to other locations where there will be similar problems.

Not surprisingly, there has been a large outpouring of opposition from conservation organizations (e.g., National Audubon Society, American Bird Conservancy, Audubon Society of Portland) and tens of thousands of bird enthusiasts, but there is significant support for the proposed lethal control from recreational fishing interests, fisheries managers (e.g., at the National Marine Fisheries Service), Columbia River tribes, the Bonneville Power Administration, and others. The public comment period ended in mid-August. The USACE is now evaluating the comments it received and will presumably issue a final environmental impact statement, followed by a formal record of decision, in a few months. Whatever the USACE decides, implementation is slated for 2015.

PSG's letter of public comment can be found on the Conservation page of the website (http://pacificseabirdgroup.org/)

Manipulating Caspian Terns: As noted above, the USACE has long been concerned about predation by Caspian Terns on salmon and steelhead smolts in the Columbia River system. Based largely on research and experimental work led by Dr. Daniel Roby and others from Oregon State University, the USACE began a social attraction project to shift the terns nesting on Rice Island in the Columbia River to East Sand Island. East Sand is closer to the Pacific Ocean, and it was believed that predation on the salmon and steelhead smolts would be reduced in that environment because of the presence of alternative marine prey (e.g., anchovy, herring). The effort was highly successful, and eventually the terns were dissuaded from nesting on Rice Island but thrived on East Sand Island, where the number of nesting terns reached nearly 13,000 birds in 2012 (6,400 pairs). In 2002, the USACE settled a lawsuit brought by the American Bird Conservancy, Defenders of Wildlife, National Audubon Society, and Seattle Audubon Society. The resulting "Caspian Tern Plan" called for redistribution of about 60 percent of the East Sand Island colony by a combination of reducing the acreage of suitable nesting habitat on East Sand and by providing alternative nesting habitat—at a 2:1 ratio—elsewhere in Oregon, Washington, and California. Since 2008, the USACE has constructed 8.3 acres of new habitat (in the form of islands) at locations away from the coast, mostly in Oregon, while reducing the availability of suitable nesting habitat on East Sand Island by allowing vegetation to grow. Caspian Terns are nesting at some of the alternative sites, but the numbers are generally low. Meanwhile, the terns on East Sand Island have nested at increasingly high densities, although as a result of disturbance by Bald Eagles (*Haliaeetus leucocephalus*) and predation by gulls (mostly *Larus delawarensis*), productivity has not always been high. The USACE now proposes to further reduce suitable nesting habitat on East Sand Island to a single acre, while also dissuading Caspian Terns from nesting at two important inland sites in eastern Washington. At the same time, the USACE proposes to enhance alternative habitat in the Don Edwards National Wildlife Refuge (NWR) in southern San Francisco Bay and attract more terns there. Only limited information is available about this latest move to manipulate the geography of nesting Caspian Terns. However, starting early in 2015, several islands created earlier as part of the South Bay Salt Pond Restoration Project will be modified to enhance their suitability for nesting Caspian Terns, and social attraction techniques will be implemented. Although endangered salmonids from the Sacramento River are present in northern San Francisco Bay, the USACE believes that Caspian Terns nesting in the south bay will not travel that distance to forage. In September, the USACE issued a Finding of No Significant Impact on its Inland Avian Predation Management Plan, thus clearing the way for the work at the Don Edwards NWR to proceed. If successful, this will be the only alternative coastal habitat provided by the USACE. No such alternatives have been provided in Washington or Oregon, even while numbers of Caspian Terns nesting within the Columbia River system will have been drastically reduced.

RESTORING CHINESE CRESTED TERNS IN THE JUISHAN ISLANDS

Since 2011, BirdLife International and the Hong Kong Bird Watching Society (BirdLife in Hong Kong) have been working with Zhejiang Museum of Natural History, Zhejiang Wild Bird Society, Ocean and Fishery Bureau of Xiangshan County, and a team from Oregon State University (led by Dr. Daniel Roby) on a restoration project for Chinese Crested Terns (*Thalasseus*

bernsteini) in the Jiushan Islands. Restoration efforts were initiated in 2013 and resumed in 2014, aided by a monitoring station built on a 2 ha island, Tiedun Dao manned by Simba Chan of BirdLife International's Asia Division from 8 May to 8 August 2014.

At least 43 Chinese Crested Terns arrived and stayed on the island of Tiedun Dao in the 2104 breeding season, and at least 20 breeding pairs formed. Notwithstanding predation by Peregrine Falcons (*Falco peregrinus*), human poachers, and three typhoons passing through the area, at least 13 young Chinese Crested Terns fledged. For a species with a current estimated global population of not more than 50 individuals, this is a remarkable result. In addition to the handful of Chinese Crested Terns and a large number of Greater Crested Terns (*Thalasseus bergii*) breeding on the Jiushan Islands in 2014, the first breeding record for China of Lesser Crested Terns (*Thalasseus bengalensis*) was recorded at Tiedun Dao. One pair laid and incubated a fertile egg, but the embryo died before hatching.

The use of audio-visual social attraction methods of decoys and playback of tern calls developed by Dr. Steve Kress from the National Audubon Society has been so successful at Tiedun Dao that as much as 90 percent of the world population of Chinese Crested Terns may now be attracted there during the breeding season. Concentration of so much of this small population at one location may be a liability (e.g., due to the potential devastation of typhoons), so there are now suggestions to consider enhancing nesting habitats and using social attraction at other locations, such as at the Wuzhishan Islands and the Mazu Islands, where Chinese Crested Terns previously have been active.

DEEPWATER HORIZON IMPACTS TO SEABIRDS

Only limited information is presently available on impacts to marine birds resulting from the blowout of British Petroleum's 2010 *Deepwater Horizon* MC 252 drilling platform in the Gulf of Mexico. The results of the government- and industry-sponsored Natural Resources Damage Assessment are mostly still held confidential, although data on bird and other wildlife carcasses picked up during the prolonged spill event are provided by the US Fish and Wildlife Service at http://www.fws.gov/home/dhoilspill/collectionreports.html.

It has long been established that carcasses of oiled birds picked up on shorelines or on the water represent only some of the avian oil-spill mortalities due to various combinations of wind, ocean currents, elapsed time, temperature, scavengers, and other factors that influence the fates and detections of oiled birds. In the case of the *Deepwater Horizon*, assessing impacts to birds was further complicated by the fact that the blowout occurred 40 km offshore and any carcasses reaching coastal marshes would be extremely hard to locate. In two new papers soon to be published in the Marine Ecology Progress Series, however, J. Christopher Haney, Harold J. Geiger, and Jeffrey W. Short (2014a and b) present estimates of *Deepwater Horizon* mortality in pelagic and coastal birds based on analyses and models using publicly available data.

Haney et al. use an exposure probability model to estimate that between 36,000 and 670,000 pelagic birds died in the offshore Gulf of Mexico (> 40 km offshore) as a result of exposure to oil from the *Deepwater Horizon*, with the most likely number near 200,000. For coastal birds (< 40 km out), the same authors used two separate approaches, a carcass sampling model and an exposure probability model, to estimate bird mortalities of 600,000 and 800,000, respectively, from the *Deepwater Horizon* event. Monte Carlo simulation of parameter uncertainty led to respective 95 percent uncertainty intervals of 320,000-1,200,000 and 160,000-1,900,000. Heavily impacted coastal species include: Laughing Gull (*Leucophaeus atricilla*), Royal Tern (*Thalasseus maximus*), Northern Gannet (*Morus bassanus*), and Brown Pelican (*Pelecanus occidentalis*). Pelagic species known to be impacted include: Audubon's Shearwater (*Puffinus lherminieri*), Great Shearwater (*Puffinus gravis*), and Masked Booby (*Sula dactylatra*).

LITERATURE CITED

Haney, J.C., H.J. Geiger, J.W. Short 2014a. Bird mortality from the Deepwater Horizon oil spill. I. Exposure probability in the offshore Gulf of Mexico. Mar. Ecol. Prog. Series. doi: 10.3354/meps10991

Haney, J.C., H.J. Geiger, J.W. Short 2014b. Bird mortality from the Deepwater Horizon oil spill. II. Carcass sampling and exposure probability in the coastal Gulf of Mexico. Mar. Ecol. Prog. Series. doi: 10.3354/meps10839

REGIONAL REPORTS FOR 2014

Edited by Julia Sommerfeld

Regional Reports summarize current and recent seabird work of interest to PSG members. Regional Reports generally are organized by location of the work, not by affiliation of the biologist. They should not be cited without permission of the researchers.

ALASKA & RUSSIA

Compiled by Robb Kaler

BEAUFORT AND CHUKCHI SEAS

Don Dragoo and **Tom Balland** (U.S. Fish and Wildlife Service [USFWS], Alaska Maritime National Wildlife Refuge [AMNWR]) collected data on populations of Black-legged Kittiwakes (*Rissa tridactyla*), Common Murres (*Uria aalge*) and Thick-billed Murres (*U. lomvia*) at Cape Lisburne, Alaska. **Don Dragoo** and **Leslie Slater** (AMNWR) collected data on populations of Black-legged Kittiwakes, Common Murres, Thick-billed Murres, and Horned Puffins (*Fratercula corniculata*) in the Chamisso Island group, Alaska.

Adrian Gall and **Bob Day** (ABR, Inc.) conducted the seventh field season of boat-based seabird surveys in the northeastern Chukchi Sea. The survey crew included: **Adrian Gall, Tricia Blake, Ashley Hovis and John Rose**. The team surfed through rough weather towards the end of August that persisted through the September survey period. These surveys are part of the Chukchi Sea Environmental Studies Program (CSESP), an interdisciplinary oceanographic study that collects data concurrently on physical and biological oceanography, benthic ecology, fisheries, contaminants, marine mammals, and seabirds. The focus of surveys shifted this year from intensive sampling of grids offshore to six long synoptic lines that include waters from the village of Wainwright to 100 NM offshore. Because of the increased attention to inshore waters, the survey team had a greater opportunity to observe eiders (*Somateria* sp.) in Ledyard Bay compared to previous years. In addition to sampling, ABR is ramping up their education and outreach efforts by introducing new material on the CSESP website (http://www.chukchiscience.org) and recording podcasts available on iTunes starting in October 2014. This year's field effort is funded jointly by ConocoPhillips and Shell E & P.

BERING SEA AND ALEUTIAN ISLANDS

Marc Romano (AMNWR) coordinated with the City of St. George on a rapid response to a recent house mouse (*Mus musculus*) invasion in the Pribilof Islands. **Steve Ebbert** and **Greg Thomson** (AMNWR) successfully eradicated mice found inside a shipping container used for storage of straw, grass seed and fertilizer on St. George Island. The effort for early detection of invasion by old-world rodents on these Bering Sea Islands renowned for their seabirds and seals is ongoing.

Annual seabird monitoring at St. George and St. Paul islands was led by **Marc Romano** with summer-long field crews consisting of **Greg Thomson** and **Ryan de Regnier** (AMNWR) on St. Paul and **McKenzie Mudge**, **Kevin Pietrzak**, and **Ryan Mong** (AMNWR) on St. George. Both crews collected data on a variety of species including Red-legged Kittiwakes (*Rissa brevirostris*), Black-legged Kittiwakes, Least Auklets (*Aethia pusilla*) Common Murres and Thick-billed Murres. In addition, population counts (conducted every three years in the Pribilofs) were completed by **Greg Thomson** and **Ryan de Regnier** on St. Paul Island, and **Matt Klostermann** and **Joel Vos** (AMNWR) on St. George Island. Annual seabird monitoring at Buldir and Aiktak islands was led by **Jeff Williams** (AMNWR) with summer-long field crews consisting of **Emily Pollom**, **John Gorey**, and **Sara Naval** (AMNWR) on Buldir (27th continuous year of data collection). They collected productivity, diet and population data on a variety of species including Red-legged and Black-legged Kittiwakes; Least Auklets, Crested (*Aethia cristatella*), Whiskered (*Aethia pygmaea*), and Parakeet Auklets (*Aethia psittacula*); Common Murres and Thick-billed Murres; along with Fork-tailed and Leach's storm-petrels (*Oceanodroma furcata and O. leucorhoa*). **Amanda Boyd** and **Stacie Evans** (AMNWR) on Aiktak (21st continuous year of data collection) monitored Horned and Tufted Puffins (*Fratercula cirrhata*), Glaucous-winged Gull (*Larus glaucescens*), Common and Thick-billed Murres, and Ancient Murrelets (*Synthliboramphus antiquus*).

Robb Kaler (USFWS) and **Leah Kenney** (Alaska Natural Heritage Program) got married at Adak Island and celebrated their union by continuing the third year of nest searching and monitoring of Kittlitz's Murrelets (*Brachyramphus brevirostris*) with support from **Lisa Spitler** (AMNWR) and **Jeff Williams**.

Kathy Kuletz and **Liz Labunski** (USFWS) completed the fifth year of pelagic seabird surveys in the Bering and Chukchi seas, as part of the 'Seabird Distribution in the Offshore Environment' project, funded by the Bureau of Ocean Energy Management (BOEM). In 2014, they placed observers on five Bering or Chukchi research cruises from July to mid-October. The 2014 seabird observers were **Raymond VanBuskirk, Terry Doyle, Kathy Kuletz, Liz Labunski, Martin Reedy, Declan Troy, and Tamara Zeller** (all USFWS employees or USFWS volunteers). **Natalie Bool** (PhD student, Institute for Marine and Antarctic Studies, University of Tasmania, Australia) also joined a Bering Sea survey, to survey Short-tailed Shearwaters (*Puffinus tenuirostris*) in their northern 'summer home'. Natalie will be comparing the Alaska at-sea survey data to her results from birds tagged and fit with data loggers at their breeding sites in Tasmania. Data from

all of the at-sea surveys will be archived in the North Pacific Pelagic Seabird Database (NPPSD). To access the NPPSD, please visit: http://alaska.usgs.gov/science/biology/nppsd/index.php.

Kathy Kuletz and **Liz Labunski** continue to collaborate with other investigators as part of the Arctic Ecosystem Integrated Survey (Arctic EIS; a multi-agency funded collaboration). Efforts have begun to synthesize oceanographic, plankton, fish, and seabird data from two years (2012 & 2013) of fieldwork in the northern Bering and Chukchi seas. The seabird observer for these cruises, **Athina Catherine Pham** has joined Arctic EIS as a Master's student, now at Hawai'i Pacific University (HPU), working with Dr. **David Hyrenbach** (HPU) and **Kathy Kuletz**.

Kathy Kuletz and **Liz Labunski** are completing manuscripts related to the 'Synthesis of Arctic Research' (SOAR) Project led by **Sue Moore** (National Oceanic and Atmospheric Administration [NOAA]). Other SOAR team members working on seabird ecology include **Brendan Hurley, Adrian Gall, Tawna Morgan,** and **Bob Day** (ABR, Inc.). Starting in 2014, **Kathy Kuletz** began collaborating with **G.L. Hunt, Jr., Martin Renner** (Tern Again Consulting), **Carol Ladd** (School of Aquatic and Fishery Sciences [SAFS], University of Washington [UW]), and **Jarrod Santora** (Farallon Institute) on their North Pacific Research Board (NPRB) funded project to examine seabird distribution in the Bering Sea under changing ecological conditions.

Steve Ebbert, refuge staff, and others have drafted an Environmental Impact Statements about feral abandoned cattle on two refuge islands. Steve is also preparing an Environmental Assessment for the control of invading introduced caribou (*Rangifer tarandus*) on another refuge island. Both projects have the potential to benefit seabirds and other native species by eliminating or reducing the impacts of non-native invasive ungulates on the refuge.

Annual seabird monitoring at Round Island in the Walrus Islands State Game Sanctuary was managed by **Ed Weiss** (Alaska Department of Fish & Game [ADF&G]). **Ryan Morrill** (ADF&G) and **Ben Histand** (ADF&G) monitored Black-legged Kittiwake, Common Murre, and Pelagic Cormorant (*Phalacrocorax pelagicus*) populations, nesting phenology, and productivity, from 12 May to 1 August 2014. Black-legged Kittiwake productivity was 0.34 chicks/nest within the monitoring plots with 34% of the 50 nests monitored being successful. Pelagic Cormorant productivity was 2.32 chicks/nest with 89% of the 84 nests monitored being successful. Seventy Common Murre nests were monitored, but complete productivity and phenology calculations were unattainable due to a truncated field season.

GULF OF ALASKA

During July-September, field crew **Naomi Bargmann** and **Stephanie Winnard** (AMNWR) monitored Fork-tailed Storm-Petrels and Tufted Puffins at East Amatuli Island. Data were collected on population trends, productivity, chick growth, and chick diet. **Arthur Kettle**, **Heather Renner,** and **Leslie Slater** (AMNWR) helped start the fieldwork and deployed time-lapse cameras for monitoring productivity of Black-legged Kittiwakes and Common Murres.

Nora Rojek (AMNWR) coordinated long-term seabird demography at Chowiet Island, Semidi Islands group, off the coast of the Alaska Peninsula. The summer field crew, **Matthew Henschen** and **Brette Soucie** (AMNWR), worked with several species including Northern Fulmar (*Fulmarus glacialis*), Black-legged Kittiwake, Glaucous-winged Gull, Common and Thick-billed Murres, Parakeet and Rhinoceros Auklets (*Cerorhinca monocerata*), and Tufted and Horned Puffins.

Nora Rojek also conducted seabird coastline surveys in August, primarily in the AMNWR's Alaska Peninsula Unit (APU), based off the AMNWR's research vessel the M/V *Tiglax*. Many islands were surveyed in the Sanak Islands group and Sandman Reefs. Additional survey crew members included **Dean Kildaw** and **Barry Sampson**. Other parts of the APU (Semidi Islands and Ugaiushak Island) were visited on the same cruise in collaboration with U.S. Geological Survey (USGS) Puffin Diet Project, led by **John Piatt** and **Sarah Schoen** (USGS).

Kathy Kuletz and **Liz Labunski**, with funding support from BOEM led pelagic seabird surveys in association with research cruises in the Lower Cook Inlet (three cruises) and northern Gulf of Alaska (two cruises). NPRB recently awarded a grant to **Russ Hopcroft** (University of Alaska Fairbanks [UAF]) to continue with the long-term Seward Line monitoring program, which will now officially include the seabird surveys led by **Kathy Kuletz**.

Seabird research on Middleton Island was curtailed in 2014 when anticipated funding failed to materialize. **Scott Hatch** and **Martha Hatch** (Institute for Seabird Research and Conservation) spent many weeks at the station between April and September, gathering seabird data wherever possible to prevent gaps in long-running time series, and also working on construction and renovation of buildings and other infrastructure at the site. **Andy Ramey** (USGS) and **Jessie Klejka** (USGS and Alaska Native Science and Engineering Program) accompanied **Brianna Williams** (Master's student, University of Georgia [UG]) at the station for 10 days in June, while Brianna stayed through mid-August, collecting observational and experimental data on seabird parasites for her Master's research, assisted throughout by **Morgan Walker** (UG). Finally, **Luke Decicco, Nick Hajdukovich** (USFWS) and a revolving cast of assistants spent a fourth consecutive season at the Middleton station (mid-August to mid-October), mist-netting, banding, and keeping detailed records of fall migration in seabirds and other avifauna.

PRINCE WILLIAM SOUND

In July 2014, USFWS biologists con-

ducted surveys of marine bird and mammal abundance in Prince William Sound (PWS). The field effort was carried out in nine surveys conducted from three survey vessels. **Dan Cushing** (M.Sc. student, Oregon State University [OSU]) completed his thesis on long-term patterns of change in the marine bird community of PWS.

SOUTHEAST ALASKA

Steve Lewis (ADF&G) visited artificial nest boxes installed at Lowrie Island six times in 2014 to evaluate productivity and time-lapse cameras were set up to monitor Common Murre productivity at Barwell Island between mid-May and mid-September. **John Maniscalco** (Alaska SeaLife Center) has been instrumental in continuing this effort that was initiated by AMNWR staff.

Stuart Fety, **Cynthia Mom**, **Nicole Deatherage**, and **Leslie Slater** (AMNWR) completed the 20th consecutive year of seabird monitoring at St. Lazaria Island. Data collection focused on population trends, annual productivity, chick growth rates, and diet sampling. Species monitored were Fork-tailed and Leach's Storm-petrels, Pelagic Cormorant, Glaucous-winged Gull, Pigeon Guillemot (*Cepphus columba*), Common and Thick-billed Murres, Tufted Puffin, and Rhinoceros Auklet. **Alexis Will** (PhD student, UAF) briefly visited St. Lazaria to retrieve data logging units that were deployed on Rhinoceros Auklet adults in previous years. Data from these units are intended to shed light on foraging behavior, habitat, and ocean conditions.

RUSSIAN FAR EAST

Vivian Mendenhall (Anchorage) continues working on conservation issues in Alaska and researching the nesting behavior of Sandhill Cranes (*Grus canadensis*). In August 2014, she visited the Okhotsk Sea on an eco-cruise by the Zegrahm company (as tourist, not staff). She visited Talan Island near Magadan, 20 years after working there. But the high point was Iona Island, a small group of rocks in the middle of the sea (56° 24' N latitude, 143° 22' E longitude). Iona is densely populated with murres (both Common and Thick-billed), numerous other seabirds, and Steller's Sea Lions (*Eumetopias jubatus*). The surprise was the Whiskered Auklet. This species occupies the Aleutian and Kurile archipelagos, where it forages in upwellings and in the passes between islands; but Iona is 1,000 km from any other island group. **Alexander Andreev** (Institute of Biological Problems of the North, Magadan) has suggested that the auklet's presence on Iona is due to upwellings that result from nearby ridges and seamounts.

DATA PRODUCTS AND SERVICES

Melanie Smith and **Nathan Walker** (Audubon Alaska) continued work to identify Important Bird Areas (IBAs) throughout the state. Their work to identify marine IBAs using at-sea survey data was published this year (Smith, M. A., N. J. Walker, C. M. Free, M.J. Kirchhoff, G.S. Drew, N. Warnock, and I.J. Stenhouse 2014. Identifying marine Important Bird Areas using at-sea survey data. *Biological Conservation* 172: 180–189). This year they identified additional IBAs for waterbirds in nearshore and interior areas, which are currently being nominated for global recognition through BirdLife International. Melanie is also working with the Aleutian-Bering Sea Islands Landscape Conservation Cooperative and biologists at the USFWS to assess climate vulnerability of IBAs in the Bering Sea. The latest map of IBAs can be found at:

http://ak.audubon.org/sites/default/files/documents/alaska_ibas_ecoregions_20aug2014.pdf.

Martin Renner and **Kathy Kuletz** are near completion of the second phase of a USFWS risk assessment for seabirds in the Aleutian Islands due to shipping traffic. In Phase I, Martin modeled seasonal patterns of seabird distribution and shipping traffic patterns in the Aleutian Islands to evaluate areas of high and low risk. In Phase II, they are working with Axiom Consulting and Design, Inc. to make these results accessible via a web-based presentation and management tool, which will also be linked to Seabirds.net.

WASHINGTON & OREGON

Compiled by Peter Hodum

OREGON

Elizabeth Phillips (Ph.D. student, SAFS, UW) is examining the influence of river plumes on predator-prey interactions, with a focus on Sooty Shearwaters (*Puffinus griseus*) and Common Murres. She is working in collaboration with **Jen Zamon** (NOAA-Fisheries) and **Josh Adams** (USGS Western Ecological Research Center [WERC]).

Turnstone Environmental Consultants, Inc. (Turnstone) conducted work related to seabirds for several projects in 2014, summarized below. The Oregon Department of Forestry (ODF) contracted Turnstone to conduct Marbled Murrelet surveys on state lands in the Coast Range of Oregon in five ODF districts (Astoria, Tillamook, Western Lane, Coos Bay, and West Oregon); **Tom Williamson** is the Turnstone project manager and **Matt Gostin** is the ODF contract administrator and primary contact. Visiting a mixture of first, second, and multi-year survey sites, surveyors conducted 896 surveys at 131 unique sites and 522 unique stations. Murrelets were detected during 39 surveys at 23 sites in five different districts, and significant behavior was observed during six of these surveys. The Bureau of Land Management (BLM) Salem District contracted Turnstone to conduct Marbled Murrelet surveys in the Mary's Peak Resource Area, Oregon; **Jeff Reams** is the Turnstone project manager and **Scott Hopkins** is the BLM contract administrator and primary contact. Turnstone biologists conducted 60 surveys at ten unique sites and 32 unique stations. Murrelets were detected during 13 surveys at five sites, and significant behavior was observed during three of these surveys. Turnstone conducted Marbled Murrelet surveys in western Oregon as a subcontractor for a linear energy project; **Tom Williamson** is the Turnstone project manager for this project. Biologists conducted ten surveys at two unique sites and ten unique

stations. No murrelets were detected at these surveys. Turnstone biologists also conducted approximately 46 additional Marbled Murrelet surveys over six unique sites and 34 unique stations for private landowners in the coast range of Oregon; **Jeff Reams** is the Turnstone project manager for this project. The project was conducted as part of the pre-management process in advance of timber management plans. Murrelets were detected during two surveys at one site, and no significant behavior was observed during these surveys.

Kim Nelson (Oregon Cooperative Fish and Wildlife Research Unit [OCFWRU], OSU) started a new project to look at the presence and occupancy of Marbled Murrelets on lands purchased in Lincoln County, Oregon as mitigation for the *New Carissa* oil spill. This project is funded by USGS and USFWS; the Confederated Tribes of the Siletz is a co-operator. The primary objective of this project is experimental: produce a robust estimate of the number of murrelets nesting on the Reed Creek property. This will be accomplished by (1) deploying multiple acoustic sensors to monitor murrelet activity for a longer period of time and over a larger area than in previous surveys, (2) conducting simultaneous acoustic and dawn audio-visual (AV) surveys on some days at each survey site to compare the relative sensitivity of the two techniques, (3) analyzing the data to produce a best estimate of the number of murrelets nesting on the Reed Creek property, and (4) identifying nest trees for possible future monitoring of nesting success. An attempt is underway to develop a correction factor between automated acoustic and PSG survey methods that could be applied to historic murrelet data to produce a more accurate estimate of historic murrelet use of the property. Murrelets were present throughout the property, though in apparently lower numbers than expected compared to the oil spill damage assessment. One potential murrelet nest was located; tree climbing this fall should verify use. Song meters were successful in recording murrelet presence throughout the landscape, but there are many limitations to their use (e.g., the amplifier is not as sensitive as human ear). Additional AV and song-meter surveys will be conducted in 2015. Research assistants and field crew in 2014 included **Mandy Wilson**, **Cathleen Rose**, **Stephen Rossiter**, **Jen Rothe**, **Abigail DeYoung,** and **Hannah Plumpton**.

Rob Suryan, Jess Porquez, Ian Throckmorton, and **Amanda Gladics** (OSU), **Alessandra Jimenez** (intern, National Science Foundation Research Experience for Undergraduates), and **Lucila Fernandez** (intern, Environment for the Americas) conducted studies of Common Murres at the Yaquina Head colony in Newport, OR. This is the eighth consecutive year of collaborative studies at this site involving OSU, BLM, and USFWS. Reproductive success (fledglings per eggs laid) for murres was low again in 2014 (15%), as in 2013 (24%). Reproductive success for the last three years (2012–2014; 15–27%) has been greatly reduced compared to the previous years (2008–2011; 54–77%). Hatching phenology in 2014 (median hatch date was 4 July) was later than 2013, but not as late as 2010–2011. Smelts have dominated murre chick diets in recent years, with little variation in reduced contributions of clupeids (primarily herring or sardine) and Pacific Sand Lance (*Ammodytes hexapterus*) compared to previous years. While murres may have experienced suboptimal foraging conditions at times during 2014, the greatest reproductive loss this year can be attributed to increased disturbance by Bald Eagles (*Haliaeetus leucocephalus*) and subsequent egg predation by gull species (*Larus* spp.). Disturbance by eagles in 2014 was particularly heavy during incubation. However, through the chick-rearing period eagle disturbances decreased and concentrated on previously unaffected areas of the colony, contributing to the total failure of many plots. Unlike 2012, when Brown Pelicans (*Pelecanus occidentalis*) caused 39% of all disturbances, pelicans were not an important cause of disturbances in 2014.

Cheryl Horton (M.Sc. student, OSU) defended her Master's thesis, which investigated top-down influences of recently recovered native, avian predators on breeding Common Murres in Oregon. She found regional changes in the distribution and abundance of murres associated with increases in Bald Eagle nest density over two decades (1988–2006). Bald Eagles were most often the main predators throughout the breeding season, and disturbance rate was negatively associated with murre reproductive success. Synergistic effects also were important, with greater reproductive loss attributable to secondary nest predators facilitated by colony disruption. Yaquina Head had the most diverse assemblage of predators and scavengers compared to colonies studied to the north and south. Cheryl has fledged from the Seabird Oceanography Lab, but is still at OSU, working on avian predation studies with **Dan Roby** (OSU, USGS) and crew in the USGS OCFWRU.

Rob Suryan, Alessandra Jimenez, and **Amanda Gladics** initiated a new collaboration with researchers at SFU, UW, USFWS, and Point Blue Conservation Science (Point Blue) to compile Common Murre diet data from breeding sites in the central and northern California Current. Using these data, **Alessandra Jimenez** led an analysis of spatial and temporal variation in murre diets throughout the California Current.

Rob Suryan, Jess Porquez, Ian Throckmorton and **Amanda Gladics** continued vessel based at-sea surveys of seabird distribution off the central Oregon coast. The research areas include the Newport Hydrographic Line, an oceanographic cross-shelf sampling line extending west from Newport, OR, and two Pacific Marine Energy Center (PMEC) potential wave energy sites. The lab has conducted 30 surveys in the three areas since May 2013, with 18 cruises in 2014. Data from the PMEC sites will contribute to a baseline study preceding the installation and testing of wave energy devices. With the use of *in situ* environmental data (i.e., sea surface temperature, salinity, chlorophyll-a, bathymetry), this work aims to explain

spatial and temporal patterns in seabird distribution.

Amanda Gladics conducted seabird surveys for ten days from Eureka, CA to Astoria, OR during the West Coast rockfish pre-recruitment survey on board the *R/V Ocean Starr*. These observational data contribute to a long-term collaborative study between the Southwest and Northwest Fisheries Science Centers (SWFSC and NWFSC, NOAA) and OSU. **Rob Suryan** and **Jess Porquez** have consulted with resource agencies and industry about seabird monitoring at the future WindFloat offshore wind demonstration site near Coos Bay, OR and have assisted with preliminary surveys of the site.

Rob Suryan and collaborators at OSU and UW continued a project to design and test an integrated multi-sensor array to continuously monitor for interactions (including impacts) of avian and bat species with offshore wind turbines. The synchronized array of sensors includes accelerometers, contact microphones, visual and infrared spectrum cameras, and bioacoustics. The team has tested various components in lab and field during the past two years. They completed the first of two experimental impact tests on a research turbine at the North American Wind Research and Training Center at Mesalands Community College, New Mexico. The fully integrated sensor test with experimental impacts will be in the fall of 2014 at the National Renewable Energy Lab, Colorado.

Shawn W. Stephensen and **Bill Bridgeland** (Oregon Coast National Wildlife Refuge Complex [OCNWRC]) conducted an aerial seabird colony survey on 03 and 04 June 2014 that included the entire Oregon coast. The aircraft used was a Bell Jet Ranger III helicopter operated by **Mike Nehring** of Northwest Helicopters (Olympia, WA). Total flight time was approximately 10 hours. All Common Murre, Brandt's Cormorant (*P. penicillatus*), Pelagic Cormorant, and Double-crested Cormorant (*P. auritus*) colonies were photographed using digital cameras and birds were counted on the digital images utilizing GIS computer software. Thousands of digital images were organized and archived for future reference. Colony attendance by murres was slightly depressed in comparison to previous years. However, murres returned to nest at several historical colony sites (particularly the Three Arch Rocks area) that had not been attended the last ten years.

Tim Halloran (USFWS volunteer) and **Shawn W. Stephensen** conducted a population status assessment of Tufted Puffin at Haystack Rock, Cannon Beach, which is within the OCNWRC. The project also included a pilot study to evaluate the feasibility of monitoring additional reproductive parameters at the island, such as breeding phenology and data collection success from shore-based vantage points. The number of Tufted Puffins present at Haystack Rock was documented during 2010, 2011, 2012, 2013 and 2014 by conducting instantaneous counts of birds on the land, water, and in the air at 15-minute intervals. The daily mean counts were 42, 33, 13, and 35 birds during 2010, 2011, 2012, and 2013 respectively. Burrow occupancy was determined and the annual breeding population estimate was calculated based on the number of viable occupied burrows. The Tufted Puffin breeding population (individual birds) at Haystack Rock was estimated to be 127 in 2010, 97 in 2011, 74 in 2012, and 143 in 2013. The 2014 data analysis is not completed yet, however, initial data review indicate 30 to 40 puffins appeared to have nested. Many negative interactions with gulls and disturbances by eagles were documented, as well as interesting social behaviors between puffins.

Joe Liebezeit and **Paul Engelmeyer** (Audubon Society), and **Amelia O'Connor** and **Shawn Stephensen** (USFWS) conducted a citizen science seabird monitoring project within the Cape Perpetua Marine Reserve. With the help of 19 volunteers, breeding productivity for three species of cormorants and abundance of Rhinoceros Auklets and Pigeon Guillemots was determined. Monitoring sites were in high-use tourist/visitor areas, including Heceta Head and Sea Lion Caves, where information was provided to the public about Oregon's marine reserves, seabird ecology, and conservation. Six plots (65 cormorant nests: Brandt's=45, Pelagic=9, Double-crested=11) on six separate cormorant colonies were monitored twice a week during the breeding period and Rhinoceros Auklet and Pigeon Guillemot counts were conducted in the Sea Lion Cave. Brandt's Cormorants had the lowest breeding productivity (0.49±0.12 [M±SE] fledglings per nest), in part due to the failure of two Brandt's Cormorant colonies that were observed to be frequented by predators. Pelagic and Double-crested Cormorants had relatively higher breeding productivity (1.89±0.35 and 1.45±0.51 fledglings per nest, respectively). Sea Lion Cave counts yielded a low estimate of breeding pairs using the cave: 163 individual Pigeon Guillemot adults and 25 individual Rhinoceros Auklet adults were the maximum counts. Chicks were rarely sighted, but one Rhinoceros Auklet and four different Pigeon Guillemot chicks were counted. Summer 2014 represents the first year of this project and monitoring will continue in 2015.

Dan Roby, Rob Suryan, and **Amanda Gladics**, and **Roberta Swift, Roy Lowe, Shawn Stephensen, Bill Bridgeland,** and **Amelia O'Connor** (USFWS) initiated a project to develop and test non-invasive population monitoring techniques for burrow-nesting seabirds at a Leach's Storm-Petrel colony. The approach combines simultaneous data collection using remote cameras and acoustic recorders that can be deployed for long periods of time, as long as an entire breeding season. During 2014, the group deployed nine remote cameras and three acoustic recorders on Goat Island, near Brookings, Oregon and conducted five field visits to install, troubleshoot, and maintain the equipment. They expect to deploy the equipment again during 2015.

WASHINGTON

During summer 2014, **Brian Cooper** (ABR, Inc.) and **Martin Raphael** (U.S. Forest Service [USFS]) conducted

follow-up radar surveys for Marbled Murrelet at eight of Olympic Peninsula drainages that they surveyed during 1996–2004 (Raphael, M.G., D. Evans Mack, B.A. Cooper 2002. Landscape-scale relationships between abundance of marbled murrelets and distribution of nesting habitat. *Condor* 104: 331–342; Cooper, B.A., Raphael, M.G., Perry, Z.M. 2006. Trends in radar-based counts of marbled murrelets on the Olympic Peninsula, Washington, 1996–2004. *Condor* 108: 936–947). These data begin to provide information on recent trends in numbers of murrelets flying into breeding areas on the Olympic Peninsula and may lead to insights into recent population trends determined by at-sea monitoring. These studies also provide preliminary information on changes in murrelet densities in particular drainages of interest.

Sue Thomas and **Lorenz Sollmann** (USFWS Washington Maritime National Wildlife Refuge Complex [WMNWRC]) conducted two aerial surveys of surface-nesting seabird on 24 islands within Flattery Rocks, Quillayute Needles, and Copalis NWRs on June 17 and 30. Species surveyed included Common Murre; Double-crested, Brandt's, and Pelagic Cormorants; and Glaucous-winged, Western (*Larus occidentalis*) and hybrid gulls, as well as Tufted Puffins, opportunistically. This survey is part of a larger effort to assess abundance and distribution of species in seabird colonies along the Pacific Coast. Common Murres were observed on Erin and Erin's Bride; Huntington, Cakesosta, Table Rock, and an unnamed island within the Quillayute Needles Archipelago; and on Jagged, Carroll Island and Pillar, White Rock, and West Bodelteh. Bird counts are currently performed using digital photos in a geospatial database.

In May, **Sue Thomas** and **Lorenz Sollmann** conducted surveys to determine abundance and distribution of Pigeon Guillemots on Protection Island NWR and select islands within the San Juan Island NWR. This effort was intended to reassess abundance of guillemots associated with refuge islands and gauge the need for an additional comprehensive survey throughout the Salish Sea. Sue and Lorenz also conducted a second year of burrow counts on Protection Island as well. Approximately 123 burrows were counted in 2014, island-wide, compared to 149 in 2012 with roughly equivalent observer hours. Bluff burrows appeared to be favored over driftwood or grassy burrows again in 2014. The goal of this survey was to assess distribution and abundance of active nests island-wide to inform refuge management. Sue and Lorenz participated in the Pacific Flyway Double-crested Cormorant survey in July with follow-up surveys in August.

Sue Thomas, **Lorenz Sollmann,** and **Brian Root** (USFWS Inventory and Monitoring Program) coordinated with **Scott Pearson** (Washington Department of Fish and Wildlife [WDFW]) and **Peter Hodum** (University of Puget Sound [UPS], and Oikonos) to conduct one of three boat-based surveys of Tufted Puffins in Washington. Both point and line transect surveys were conducted with puffins noted as either on land, in the water, or in flight. Other species noted include Brandt's, Pelagic and Double-crested Cormorants; Common Murres; Western, Glaucous-winged, and hybrid gulls; Pigeon Guillemots; and Black Oystercatchers (*Haematopus bachmani*). Data are currently being compiled and analysed; puffins were observed on 12 of 13 islands surveyed.

Sue Thomas continued to work with NOAA's Unmanned Aircraft Systems (UAS) program to test and further refine field techniques for monitoring seabird colonies within Flattery Rocks, Quillayute Needles, and Copalis NWRs along the outer coast of WA. Objectives included targeting sequential, overlapping still-frame shots of the colonies and evaluating the resolution of photographs from NOAA's, fixed-wing UAS (Puma). Sequential shots are necessary for counting dense clusters of nesting seabirds in these colonies. Testing was limited to three field days this year due to interest from other Refuges in evaluating the systems. Sequential shots taken with the camera on board the Puma were not feasible because of limitations in the navigation software and delays required to downlink each photograph. However, the navigation software associated with the rotary-blade drone, Quadracopter, has this capacity. NOAA is working on approving launch and recovery protocols at sea for the Quadracopter, a necessary step for surveys of these refuge islands. Sue also recently completed a pilot project testing the use of remote trail cameras in a diet study of Pigeon Guillemot chicks on Protection Island NWR. The objectives of this study were to assess the use of remote cameras in identifying and quantifying species of prey and feeding frequencies. Photos have not yet been fully analyzed, but it appears that use of these cameras can significantly increasing the observation period without disturbing chicks or other species nesting nearby. Resulting data, compiled with other guillemot diet studies within the Salish Sea, may prove sufficient data for use as a dashboard indicator of the Puget Sound Partnership's restoration efforts.

Scott Pearson, **Tom Good** (NOAA, NWFSC), and **Peter Hodum** continued their long-term study of reproductive success patterns of Rhinoceros Auklets on Protection (ninth year) and Destruction (seventh year) islands, Washington. Dietary studies were not conducted during the 2014 season on any of the islands. Preliminary analyses of burrow occupancy and fledging success suggest that both parameters were comparable to previous years on both Protection and Destruction islands. Scott and Peter also conducted boat-based surveys of Tufted Puffin colonies on the Outer Coast of Washington to compare with results of surveys conducted during the 2006–2007 breeding seasons. Results suggest that all colonies occupied during the initial surveys remained occupied in 2014.

Undergraduate research students in **Peter Hodum's** lab at UPS, in collaboration with Oikonos, conducted seabird-related research on four focal projects during the summer of 2014: (1) a second year of a population monitoring program for Pigeon Guillemots in the Tacoma

area, mapping breeding colonies, comparing population sizes to results from surveys conducted between 1999–2003, determining reproductive success, and evaluating diet composition; (2) as part of a larger program focused on documenting plastic ingestion patterns in Pacific seabirds, quantifying the frequency of occurrence and the types of marine plastic debris present in the stomachs of forage fish species caught by Rhinoceros Auklets; (3) a pilot study of neurophysiological impacts of plastic ingestion in Northern Fulmars; and (4) impacts of shoreline armoring on habitat use patterns of marine birds in Puget Sound.

In December 2011, a Geographic Information Systems (GIS) mapping project was initiated to examine whether there was correlation between the declining Marbled Murrelet population trends and increasing gillnet fishery landings within the Washington State boundaries of the Salish Sea. The first component of the GIS mapping project overlaid Marbled Murrelet population densities with non-tribal fisheries catch effort for the All-Citizen's fisheries to examine seasonal variations in foraging and fishing trends by marine catch areas. The second component was to identify areas of concern where increased fisheries and high murrelet densities coincide from 2001–2010. Results demonstrated that, overall, in areas of high Marbled Murrelet densities, lower non-tribal fishing effort occurred; in areas of low Marbled Murrelet densities, higher non-tribal fishing effort occurred. In 2013, treaty-tribal fishing effort was overlaid with Marbled Murrelet densities to confirm whether tribal fishing effort was demonstrating the same trends. Results of the GIS mapping project also demonstrated that the tribal fishery trends remained the same as the non-tribal fishery trends, even though tribal fisheries had a higher rate of gillnet fishing overall. Cooperators include **Gary Falxa** and **Martin Raphael** (USFS), **Deanna Lynch** and **Nancy Brennan-Dubbs** (USFWS), **William Beattie** (Northwest Indian Fisheries Commission), **Kyle Adicks** and **Kendall Henry** (WDFW) and **Amilee Wilson** and **Barbara Seekins** (National Marine Fisheries Service [NMFS]). This work is funded by NOAA, and is expected to be completed in 2015.

Emily Runnells (M.Sc. student, SAFS, UW) has completed her study of seabird foraging ecology in the San Juan Islands under the guidance of **George Hunt**. Her research documented significant decreases in seabird foraging activity between 1994–1997 and 2010–2011, as well as a decrease in area-integrated backscatter (a measure of fish abundance), and in calanoid copepod abundance, while the abundance of *Noctiluca* dynoflagellates increased. The results suggest that a shift in plankton composition and abundance has had a negative impact on higher trophic-level species in the Salish Sea ecosystem.

Charles Menza, Brian Kinlan, and **Arliss Winship** (NOAA National Centers for Coastal Ocean Science) are developing statistical models and maps of marine bird species off the coast of Washington, from nearshore to the U.S. Exclusive Economic Zone. The models will support offshore renewable energy planning and other ecosystem-based management needs. They are using multiple at-sea transect surveys spanning several decades compiled from different federal, state, NGO, and academic organizations, and a database of oceanographic and environmental predictors. Machine-learning models are being used to produce seasonal, high-resolution (2–4 km) maps of estimated long-term average relative occurrence and abundance for eight marine bird species off Washington. The project is funded by the Washington State's Department of Natural Resources. The final report and a data package will be available in mid- to late 2015 at:

http://coastalscience.noaa.gov/

OREGON AND WASHINGTON

During 2013–2014, **Amanda Gladics, Troy Guy** (Washington Sea Grant [WSG]), and **Joe Tyburczy** (California Sea Grant [CSG]) spent more than 30 days at sea on five different longline vessels investigating seabird avoidance methods and collecting observations on seabird interactions with fishing gear. The group continues to work closely with the NOAA West Coast Groundfish Observer Program to characterize the diversity of vessels and gear types in this fleet, and have provided a subset of fishery observers with equipment to measure the sink rates of longlines on vessels selected for observer coverage.

Troy Guy and **Ed Melvin** (WSG) continued to collaborate with the marine supplier LFS Inc. to ensure that streamer lines are commercially available to the Alaska longline fleet and are provided at no charge for tribal and non-tribal longline vessels on the West Coast. NMFS and the Pacific States Marine Fisheries Commission funded the distribution of 145 streamer lines to West coast longline vessels in 2013–2014. Troy Guy left WSG in August 2014 for adventures in plumbing and business management at Guy Plumbing & Heating, Inc. in Menlo Park, CA. His energy, expertise and many contributions to seabird research and conservation will be sorely missed.

Wildlife biologists **Shawn W. Stephensen** and **Daniel Elbert** (USFWS) conducted a coastal aerial survey of California Brown Pelicans (*Pelecanus occidentalis californicus*) on 10–11 September 2014. The 2014 survey area was from Smith River, Del Norte County, northern California to Willoughby Rock, Grays Harbor County, central Washington. All bays, rocks, reefs, islands, coastal beaches, and waters up to 0.5 mile offshore were included in the survey. The aircraft used was a fixed-wing Cessna 185, FAA registration number N732K, operated by USFWS pilot **Charles (Corky) W. Roberts** from the Office of Law Enforcement, Burbank, Washington. Survey flight altitude ranged from 60 to 245 meters above ground level and aircraft speed ranged from 145 to 210 km/h. A GPS recorded the flight track of the aircraft throughout the entire survey. A total of 3,416 individual pelicans were counted in 2014, in comparison to counts during 2001–2013 that resulted in a range of 3,416 to 18,769. Technicians under the direction of **Dan Roby** counted

9,960 pelicans on East Sand Island in the evening of 11 September 2014, whereas USFWS counted 890 earlier in the day. The counts were conducted from a boat 50–75 m offshore, in the evening (when birds return from foraging to roost). East Sand Island continues to be the site of the largest congregation of pelicans during the summer on the Oregon coast.

Ed Melvin, Troy Guy, Rob Suryan, Amanda Gladics and **Joe Tyburczy** continue to promote seabird conservation through research and outreach in CA, OR and WA groundfish fisheries with funding from NOAA NWFSC and Northwest Region, National Fish and Wildlife Foundation (NFWF) and the Packard Foundation. In 2013–2014, they expanded outreach to include distribution of seabird identification and life history information, and bycatch mitigation outreach materials in major fishing ports from Northern California to Washington, promoted seabird avoidance at several industry and public events, produced a direct mailing that was sent to all limited entry sablefish permit holders, developed a website (seabirdbycatch.washington.edu) and conducted informational meetings with fishermen at eight West coast ports (Neah Bay, Westport, Astoria, Newport, Charleston, Port Orford, Eureka, and Fort Bragg).

OTHER REGIONS

George Hunt is currently involved with three projects: (1) a comparison and contrast of the role of advection in the polar and sub-polar regions of the Arctic and Antarctic with a number of co-authors that derives from an Ecosystem Studies of Sub-Arctic Seas workshop in Korea two years ago; (2) an examination of top-down and bottom-up controls of euphausiids in the Bering Sea as part of the Bering Sea synthesis effort to pull together the findings from the Bering Sea Ecosystem Study and Bering Sea Integrated Ecosystem Research programs in the Bering (2007–2010); and (3) a joint effort with **Jarrod Santora** (SWFSC), **Martin Renner**, **Kathy Kuletz**, **Lisa Eisner** (NOAA Alaska Fisheries Science Center), and others to look at the pelagic seabird data that has accumulated since 1975 in the Bering. This work will examine along-shelf structure in the seabird community, across-shelf changes since 1975, hotspots, and the timing of seasonal movements.

Peter Kappes is working on a Ph.D. with **Katie Dugger** at OSU, investigating the reproductive ecology and population dynamics of Adélie Penguins (*Pygoscelis adeliae*) breeding on Ross Island, Antarctica.

Michelle Kappes is an instructor and researcher in the Department of Fisheries and Wildlife at OSU, where she has been teaching classes online and on campus, and is continuing research on albatrosses in collaboration with **Robert Suryan** and **Gabrielle Nevitt** at the University of California Davis (UCD).

Rob Suryan has continued satellite tracking efforts on Short-tailed Albatross (*Phoebastria albatrus*), now in the twelfth year, with collaborators at the Yamashina Institute for Ornithology, Ministry of Environment Japan, and USFWS. There were no new deployments in 2014, but he and his collaborators **Kiyoaki Ozaki**, **Fumio Sato**, and **Tomohiro Deguchi** (Yamashina Institute for Ornithology) are still tracking birds from tagging efforts in previous years. The current focus is assisting with monitoring the attendance of hand-reared birds and their breeding attempts at the new colony, as well as data analysis and manuscript preparation on satellite-tracking data collected from these birds after fledging. **Michele Kappes, Rob Suryan**, and collaborators at the Yamashina Institute for Ornithology are continuing to analyze the wealth of Short-tailed Albatross tracking data.

Amanda Gladics and **Rob Suryan**, along with **Laura Todd** and **Ellen Lance** (USFWS) conducted a review of new research and information on the biology of short-tailed albatross for a 5-year review of the Short-tailed Albatross Endangered Species Recovery Plan. The final document should be publicly available in the coming months.

NORTHERN CALIFORNIA

Compiled by Anna Weinstein

Julie Thayer and **Heather Robinson** (Farallon Institute) along with **Tori Seher** (National Park Service) monitored seabirds on Alcatraz Island in central San Francisco Bay. This is one of very few estuarine colonies of pelagic or coastal seabirds such as Brandt's Cormorant. Seabird populations on Alcatraz experience substantial disturbance from different human sources, and a study of fireworks effects has been completed. A relational database and analyses of other types of disturbance are underway. Results suggest that cumulative effects of disturbance may cause increased behavioral sensitivity in Brandt's Cormorants, which may be compounded by unfavorable environmental conditions (Robinson et al., manuscript submitted). Reproductive success of Brandt's Cormorants and Western Gulls on Alcatraz in 2014 was near or above the long-term means of 16- and 20-year time series, respectively, coincident with increases in important pelagic schooling prey (e.g., juvenile rockfish *Sebastes* spp.) and demersal prey (e.g., sanddab *Citharichthys* spp.). Both seabirds appear to have recovered from severe declines in population and productivity in 2009–2010.

Josh Adams is coordinating several seabird studies within the northern California Current and Hawai'i. **Emma Kelsey** (USGS WERC), in collaboration with BOEM, is assembling a multivariate database to quantify vulnerability of seabirds to offshore wind farms in the California Current System. Emma completed her thesis at San Jose State University in July, where she was working with **Scott Shaffer** (San Jose State University [SJSU]) to study the incubation behavior of Cassin's Auklets on Southeast Farallon Island, CA. The project was done in collaboration with **Pete Warzybok, Russell Bradley** and **Jamie Jancke** (all Point Blue).

Jonathan Felis (USGS WERC) is working to complete data analyses as-

sociated with offshore aerial seabird surveys conducted during the USGS Pacific Continental Shelf Environmental Assessment program (supported by BOEM). Jonathan is also coordinating multi-taxa seabird tracking studies on Lehua Island off Ni'ihau Island, Hawai'i. **Bill Henry** (USGS WERC) is compiling a cooperative USGS WERC at-sea seabird telemetry database and atlas, and assisting with data compilation and analyses related to the ranging behaviors of seabirds at sea in the California Current and Hawai'i.

Phil Capitolo (University of California, Santa Cruz [UCSC]), **Allison Fuller** (Humboldt State University [HSU]), **Wayne Burnett** (California Department of Fish and Wildlife [CDFW]), and others conducted 2014 aerial photographic surveys of breeding colonies of Common Murres, Brandt's Cormorants, and Double-crested Cormorants throughout coastal California. Principal Investigators were **Gerry McChesney** (USFWS), **Rick Golightly** (HSU), and **Breck Tyler** (UCSC). Funding and assistance were provided by CDFW (**Carie Battistone**), California Sea Grant, and USFWS Migratory Birds. This was the 22nd consecutive year in which surveys have been conducted. Several projects determining breeding population estimates and trends are ongoing, and long-term trends of Brandt's Cormorants in the Gulf of the Farallones were recently published in Marine Ornithology.

Scott Shaffer (SJSU) and **Hillary Young** (UC Santa Barbara) are studying the foraging ecology of tropical boobies at Palmyra. The project is funded by the National Geographic Society. **Rachael Orben** (Ph.D. student, UCSC) has nearly finished her doctoral thesis with Scott. Her thesis work is part of a large project funded by NPRB spear-headed by **Dave Irons** (USFWS) and **Dan Roby**. Rachael's work focuses on the winter distribution and ecology of Black-legged and Red-legged Kittiwakes and Thick-billed Murres. **Caitie Kroeger** (UCSC) and **Scott Shaffer** are collaborating with **David Thompson** and **Paul Sagar** (National Institute of Water and Atmospheric Research in New Zealand). Caitie is studying the foraging ecology and energetics of two albatross species at Campbell Island in New Zealand. She recently completed a crowd sourcing campaign to fund the analysis of samples using doubly labeled water. **Corey Clatterbuck** and **Emma Kelsey** recently completed their Master's theses at SJSU. Both used novel egg loggers to investigate the egg attendance behavior of different seabirds (auklets, gulls, and albatrosses). These projects were conducted in collaboration with **Lindsay Young** and **Eric VanderWerf** (Pacific Rim Conservation [PRC]) and **Russell Bradley**, **Pete Warzybok**, and **Jamie Jahncke**. **Anne Cassell** (M.Sc. student, SJSU) is writing her Master's thesis with **Scott Shaffer**. Anne has been examining chick growth and diets of Western Gulls at Año Nuevo Island and the Farallon Islands in collaboration with **Russell Bradley**, **Pete Warzybok**, and **Jamie Jahncke**. Finally, **Scott Shaffer** is collaborating with **Leigh Torres**, **Rob Suryan**, **Hillary Young**, **Josh Adams**, **Russell Bradley**, **Pete Warzybok**, and **Jamie Jahncke** to study the foraging ecology of Western Gulls using GPS loggers at various colonies along California and Oregon.

The north coast Marine Life Protected Areas Baseline Seabird studies are being conducted by **Rick Golightly** (HSU) and **Daniel Barton** (HSU) in collaboration with **Dan Robinette** (Point Blue), **Phil Capitolo** and **Breck Tyler** (UCSC). Included in this effort was an 8th year of reproductive assessments of Common Murres at Castle Rock conducted with **Stephanie Schneider** and **Ashely Donnell** (HSU), and with **Ken Griggs** and **Eric Nelson** (USFWS Humboldt Bay).

The Marbled Murrelet Effectiveness Monitoring Program aims to assess the status and trends of Marbled Murrelet populations and nesting habitat, from the Canada–Washington (WA) border to San Francisco Bay, California, and to evaluate the effectiveness of the Northwest Forest Plan in conserving murrelets. The program has used boat-based transects in the coastal waters of this area since 2000 to monitor murrelets; other seabird species are also recorded. Washington surveys were led by **Scott Pearson** and **Monique Lance** (WDFW) in the Puget Sound, Strait of Juan de Fuca, and outer coast. Surveys in northern and central Oregon were led by **Craig Strong** (Crescent Coastal Research). Population monitoring did not occur in southern Oregon and northern California in 2014 due to budget constraints; these areas will be surveyed in 2015. The program's habitat monitoring team is currently completing a modeling analysis of murrelet nesting habitat distribution and trends through the first 20 years of the NWF Plan (1993–2012). **Marty Raphael** leads this analysis, with a team that includes **Kim Nelson**, **Andrew Shirk** (UW), **Deanna Lynch** and **Rich Young** (USFWS), and **Scott Pearson.** The program also continued work to evaluate the relative influence of terrestrial factors (e.g., nesting habitat limitations) and marine conditions (e.g., primary productivity, bathymetry) on murrelet distribution and trends at sea; **Marty Raphael** leads this effort as well. A publication on this work is available from Raphael or can be downloaded at:

http://authors.elsevier.com/sd/article/S0924796314001614

Other program contributors include **Jim Baldwin** and **Linda Long** (USFS-Pacific Southwest Research Station), plus the many seasonal technicians who make the population surveys possible. **Gary Falxa** coordinates the Northwest Forest Plan murrelet monitoring program. Reports with results of the habitat and population monitoring are available at:

http://www.reo.gov/monitoring/mm-overview.shtml

Humboldt Redwood Company, LLC (HRC) continued the conservation activities for the Marbled Murrelet under the company's Habitat Conservation Plan (HCP). Project leaders were **Sal Chinnici** and **Mark Freitas** (HRC). The HCP requires tracking of murrelet occupancy and numbers over time using both radar and audio-visual (AV) survey techniques. Surveys were continued in 2014 at the Headwaters Forest Reserve and Humboldt Redwoods State Park (the

Reserves), and also at the Marbled Murrelet Conservation Areas (MMCAs) on HRC forestlands, with the collaboration of **Sean McAllister (**O'Brien Biological Consulting), and **Adam Brown** (HRC). Since the inception of HCP monitoring in 1999, behaviors indicating occupancy have been observed in the MMCAs and Reserve stands using AV surveys. Final analyses of the 2014 data have not yet been conducted. The 2013 data indicated that after 11 years of monitoring (since the 2002 baseline) there has been an increase in radar counts in the MMCAs but not in the Reserves.

Michelle Hester, **Ryan Carle, Jessie Beck,** and **David Calleri** (Oikonos Ecosystem Knowledge [Oikonos]) continued to monitor population and productivity of all breeding seabird species and diet of Rhinoceros Auklets at Año Nuevo Island. Productivity was above average for Rhinoceros Auklets, Cassin's Auklets, (*Ptchoramphus aleuticus*) Western Gulls, and Brandt's Cormorants, probably driven by an abundance of quality prey. Juvenile rockfish (*Sebastes* spp.) dominated Rhinoceros Auklet chick diet in June and early July, whereas chicks were provisioned almost exclusively with Northern Anchovy (*Engraulis mordax*) during late July. The Rhinoceros Auklet population remained stable, while the Cassin's Auklet population continued to grow. Pelagic Cormorant productivity was above average for the island, but was very poor on the mainland for the second consecutive year due to Common Raven (*Corvus corax*) depredation of eggs. Video monitoring of the Pelagic Cormorant colony was initiated to understand the population and productivity impacts of nest depredation by Common Ravens. Restoration of native plants to stabilize soil for burrow-nesting Rhinoceros and Cassin's Auklets continued to be successful with high numbers of both species breeding in natural burrows in the restoration area.

Restoration and monitoring of seabird habitat at West Cliff Drive, Santa Cruz, CA, continued in 2014 under the management of **Bill Henry** (USGS, Oikonos), **Josh Adams**, **Helen Christianson** and **Ryan Carle** (Oikonos). Invasive ice plant in this area can limit seabird nesting habitat by overgrowing crevices of Pigeon Guillemots and flat coastal terraces used by Brandt's Cormorants. The project removed ice plant from four plots on this popular stretch of coast and restored the native coastal plant community. 2014 was the fourth year that citizen scientist **Alayne Meeks** monitored population and productivity of Brandt's Cormorants nesting adjacent to restoration plots.

The Coastal Ocean Mammal and Bird Education and Research Surveys (BeachCOMBERS) is coordinated and managed by **Hannah Nevins** and headed by Principal Investigator **Jim Harvey** (both Moss Landing Marine Laboratories [MLML]). The program continues to systematically survey beaches in the Santa Cruz, Monterey, and San Luis Obispo County to determine human and natural impacts to marine birds and mammals within our coastal ecosystem. Project leaders completed a volunteer training session at MLML this past September. The Southern Chapter, implemented in 2013, is headed by Principal Investigator, **Robert McMorran** (USFWS).

Oikonos' Biological Indicators of Ocean Plastic Pollution Program in Santa Cruz is managed by **Hannah Nevins** and **Jessie Beck**. They continue to track trends in plastic ingestion of Procellariids (Albatrosses, Northern Fulmars and Shearwaters). Specimens originate as commercial fishery bycatch (Alaska and Hawai'i) and carcasses collected from beach surveys (BeachCOMBERS) in the Monterey Bay National Marine Sanctuary. Data from this long-term monitoring program will be used in a Plastic Ingestion Review Paper for scientific publication.

The Marine Seabird Health Study is entering its ninth year coordinated by **Hannah Nevins** (UCD), with **Dr. Melissa Miller** (UCD and California Dept. of Fish and Wildlife Office of Spill Prevention and Response [CDFW-OSPR]), **Laird Henkel** (CDFW-OSPR), and **Jessie Beck** (Oikonos) at the CDFW-OSPR Marine Wildlife Veterinary Care and Research Center in Santa Cruz (MWVCRC). The project aims to provide a quantitative demographic assessment of disease, chronic oiling, plastics, and other mortality factors affecting seabirds in California, using birds collected during beach surveys, from fishery bycatch, and from rehabilitation centers. This study provides a regional information center for federal, state, and local resource managers, and is supported in part by CDFW-OSPR, MLML, UC Davis Wildlife Health Center (UCD), Oikonos Ecosystem Knowledge, NOAA and USFWS. Since 2005, the program's staff have performed necropsies on more than 3,600 specimens, representing 76 species. In 2014, the Marine Seabird Health Study at MWVCRC, in collaboration with **Michelle Hester** and supported by NFWF and NOAA, continued investigating the demographics of seabird bycatch and the incidence of plastic ingestion by Northern Fulmars and other species collected by NOAA Observer Programs (Hawaii and Alaska).

Craig Strong continued monitoring Pelagic Cormorants in Del Norte County, California. Pelagic Cormorants had the best year ever out of the past nine years, both in terms of number of successful nests and in average brood size. This corresponds with exceptionally cool coastal waters and strong upwelling indices seen south of Cape Blanco, Oregon, in the past two years. While these data are for only one small colony (Tolowa Rock), a second site was monitored for the first time in 2014 (Hunter Island). We hope to coordinate with other pelagic monitoring efforts in the CA current to make full use of this indicator species in characterizing nearshore productivity for seabirds.

In 2014, the Common Murre Restoration Project (USFWS Fremont, CA; HSU, Arcata, CA, and others) concluded its 19th season of seabird colony restoration and monitoring in central California, with funds from the Luckenbach Oil Spill Trustee Council. Co-Principal Investigators are **Gerry McChesney** and **Rick Golightly**. **Allison Fuller** (HSU)

coordinated field activities. Field biologists in 2014 included **Johanna Anderson, Ryan Berger, Jared Zimmerman, Justin Windsor, Bryan White,** and **Ryan Potter**. Monitoring was conducted at Point Reyes Headlands, Drake's Bay Colony Complex, Devil's Slide Rock and Mainland, and Castle-Hurricane Colony Complex. The Common Murre colony at Devil's Slide Rock, recolonized using social attraction in 1996–2005, is now recovered to near historical numbers. Aerial photographic surveys of northern and central California Double-crested Cormorant, Brandt's Cormorant, and Common Murre colonies were conducted in collaboration with **Phil Capitolo** (UCSC) and **Carie Battistone** (California Deptartment of Fish and Wildlife). In late 2013, they finalized a report summarizing baseline seabird colony monitoring in California's North Central Coast Region of MPAs, in collaboration with **Dan Robinette**, **Harry Carter** (Carter Biological Consulting) and others. This report includes updated breeding population estimates for seabirds between Pt. Arena and Pigeon Pt.

Emily Whitmer of the Oiled Wildlife Care Network (School of Veterinary Medicine, UCD) and colleagues have completed a study investigating the physical effects of exposure to chemical dispersants and chemically dispersed crude oil on the feather structure, waterproofing, thermoregulation, and behavior of Common Murres.

Jeff Davis, Phil Capitolo, Dave Lewis, Bill Henry, Peter Gaede and **Glenn Ford** (all UCSC; **Breck Tyler**, Principal Investigator) continued to conduct aerial surveys of marine birds and mammals in California continental shelf waters under contract with CDFW-OSPR (**Holly Gellerman**). The surveys are designed to collect baseline distribution and abundance data and to maintain rapid-response capabilities for oil spills. During the past year, the team conducted surveys from San Mateo to San Diego counties.

Mark Rauzon (Laney College), along with **Meredith Elliott** (Point Blue), conducted the last survey of the Double-crested Cormorants on the San Francisco-Oakland Bay Bridge. The colony will be displaced by the bridge demolition, ending 25 years of colony surveys. Mark was also fortunate to see the Salvin's Albatross (*Thelassarche salvini*) off Half-Moon Bay in July. Invited to represent PSG, he attended the International Ornithological Congress in Japan and participated in the round table discussion about seabird predator eradication for Japan and Korea. Along with **John Gilardi**, Rauzon visited Wake Island for two weeks in September to survey seabirds. His book about island conservation in the tropical Pacific will be released in 2016 by University of Hawai'i Press.

Dave Press (Point Reyes National Seashore [PRNS]) continues to monitor and protect Western Snowy Plovers (*Charadrius nivosus*). In 2014, the last chicks fledged on September 12th, bringing the total number of fledged chicks to 15 for the season. Unfortunately, this was only a third of the chicks hatched this season; a lower rate of fledging success than the park has seen the last couple of years. On the positive side, the 2011 restoration area where European Beach Grass (*Ammophila arenaria*) was removed saw increased plover activity, with 14 nests laid in 2014. This was the first year nests successfully hatched and chicks fledged from the restored area.

Ben Becker and Dave Press (PRNS) continue to collaborate with **Gerry McChesney** to monitor seabirds at Point Reyes. PRNS is also collaborating with **Anna Weinstein** (Audubon California), **Harry Carter**, **Mike Parker,** and **Phil Henderson** (California Institute of Environmental Studies) for the third consecutive year (2012–2014) of Ashy Storm-petrel (*Oceanodroma homochroa*) monitoring at Bird Rock, Stormy Stack, and the Point Reyes Headlands. The second year of Pigeon Guillemot nest-box camera sampling at PRNS was also completed. Additionally, PRNS, The California Academy of Sciences, and the Environmental Action Committee of West Marin have begun an "MPA Watch" program to document human activities in Marine Protected Areas along the PRNS coastline. This will include monitoring boats in the special closures around Stormy Stack, Point Resistance, and the Point Reyes Headlands.

Sage Tezak, Manager of the Gulf of the Farallones National Marine Sanctuary's Seabird Protection Network, works to minimize levels of human disturbance (i.e., airplanes, boats) to breeding and roosting seabird colonies along the California coast. This year, the Network has encouraged communication among pilots and boaters about the importance of giving seabirds space. An online wildlife disturbance reporting form is available. Reporting disturbances helps resource managers conduct targeted outreach, track repeat offenders and is useful to enforce wildlife regulations.

Anna Weinstein collaborated with **Rob Doster** (USFWS) and **Ron LeValley** (Mad River Biologists) to publish the first-ever study of the distribution and abundance of Black Oystercatcher in California, in *Marine Ornithology*. The study was conducted by over 150 citizen volunteers and agency biologists. 2014 marks the third year of oystercatcher productivity monitoring conducted by citizen volunteers and agency biologists from Mendocino through San Luis Obispo counties including baseline monitoring at a subset of Marine Reserves. Audubon worked with commercial fishermen and **Geoff Shester** (Oceana) to initiate the first phase of a fishery management plan in California for Pacific Herring (*Clupea pallasii*), an essential prey item for seabirds. Audubon worked with staff at USFWS Region 8 to increase management attention to Pacific Brown Pelicans in the wake of multiyear breeding failure at the Channel Islands, and more recently in Mexico.

Shaye Wolf (Center for Biological Diversity [CBD]) and allies gained needed protections for the highly endangered Marbled Murrelet population in the Santa Cruz Mountains. CBD reached a settlement agreement with California Department of Parks and Recreation in March 2014 that requires mandatory measures to protect Marbled Murrelets in Big Basin Redwoods, Portola, and Butano state parks. This includes comprehensive trash

management, extensive public outreach, annual monitoring of Marbled Murrelet status and predator numbers, and also a comprehensive assessment every three years requiring further action, if murrelet status does not improve. CBD is evaluating the USFWS 2013 determinations that Endangered Species Act protection is not warranted for the Kittlitz's Murrelet and Ashy Storm-petrel, and identifying options to increase conservation action for these species.

SOUTHERN CALIFORNIA

Compiled by Annette Henry

PELAGIC RESEARCH

Since 2011, the Southwest Fisheries Science Center (SWFSC) of NOAA has had no ship time for continuing the time series of cetacean and ecosystem assessment surveys in the Pacific (though we are hopeful for 2014). These surveys have been the platforms on which seabird data historically have been collected. Seabird research for **Lisa T. Ballance** and **Robert Pitman** (both SWFSC) has, therefore, been focused on mining existing data, largely through collaborations with graduate students. Lisa and Bob are pursuing a multinational effort with colleagues from Central American countries to investigate the role of the Costa Rica Dome in the greater eastern tropical Pacific (including its importance to seabirds).

Trevor Joyce, a doctoral candidate working with **Lisa Ballance** at Scripps Institution of Oceanography (SIO) and NOAA SWFSC, continued research on the oceanic abundance distributions, feeding ecology, and response to El Niño Southern Oscillation climatic variability in both threatened and common seabird species employing SWFSC's extensive time series of seabird transects surveys in the Central and Eastern Pacific. In austral summer 2013-2014, Trevor also took part in seabird monitoring fieldwork with NOAA's Antarctic Marine Living Resources Division at Cape Shirreff in the South Shetland Islands, Antarctica.

R. Cotton Rockwood (Ph.D. student, SIO), in collaboration with **Lisa T. Ballance**, is synthesizing a wide range of datasets in order to compile a composite product that represents comprehensive at-sea threats to seabirds of the Pacific in a spatially explicit way. They are focusing on the North Pacific, and the maps include measures of 12 categories of threats: organic pollution, inorganic pollution, shipping, marine debris, large oil spills, bycatch, fisheries competition, fisheries ecosystem disturbance, sea surface temperature change, and wind speed change. By identifying the intensity and the number of threats co-occurring across space, the maps will identify regions of high and low concern with regard to anthropogenic impacts. Additional comparisons will be made for important ecological regions such as the California Current, Bering Sea, and the North Pacific Transition Zone, as well as among established, pending, and recommended Important Bird Areas.

Annette Henry (NOAA) continues to look at the distribution of select seabird species within the eastern tropical Pacific and California Current using data collected by the SWFSC as part of their cetacean and ecosystem assessment surveys. She also studies Eared Grebes (*Podiceps nigricollis*) with **Joseph Jehl** (Smithsonian Institution), with a focus on migration energetics and physiology.

HAWAI'I

Compiled by Annette Henry

Lindsay Young just completed a second predator-proof fence in Hawai'i, at Kilauea Point National Wildlife Refuge on Kaua'i, in collaboration with **Jessica Behnke** (PRC) the American Bird Conservancy, USFWS, and the Kaua'i Endangered Seabird Recovery Project. Preparations have begun in anticipation of translocating Newell's Shearwaters (*Puffinus newelli*) to the site once it is secure from predators. This fence has built on the success of Hawai'i's first predator proof fence at Kaena Point Natural Area Reserve on Oahu, an area that has seen a doubling in seabird productivity as a result, as well as colonization by a new species in the first three years since the fence was completed. With partners at USGS, Oikonos and the state of Hawai'i, Lindsay is also participating in a multi-species tracking project including Laysan Albatross (*Phoebastria immutabilis*), Wedge-tailed Shearwaters (*Puffinus pacificus*), Red-tailed Tropicbirds (*Phaethon rubricauda*) and Red-footed Booby (*Sula sula*) to determine pelagic habitat use of these species to inform wind energy permit applications. Along with **Eric VanderWerf**, Lindsay continues monitoring of Laysan Albatrosses and Wedge-tailed Shearwaters at Kaena Point, as well monitoring and threat control for Red-tailed Tropicbirds on Oahu.

Rae Okawa, Development Coordinator with the Hawai'i Wildlife Center (HWC), reports that the center is celebrating its three-year anniversary in November 2014. Seabirds that were brought to HWC in 2014 include two Brown Boobies (*Sula leucogaster*), one White-tailed Tropicbird (*Phaethon lepturus*), two Leach's Storm-Petrels, one Red-footed Booby, one Sooty Shearwater, three Wedge-tailed Shearwaters, and one Bulwer's Petrel (*Bulweria bulwerii*). Birds were brought to HWC from Kaua'i, Maui, and Hawai'i Island. Patients came in for a variety of reasons, including impact injuries, contaminant spills, debilitation, and displacement. The HWC received one mystery spill oiled bird in 2014, a Sooty Shearwater found off of Hawai'i Island. HWC President and Center Director **Linda Elliott**, who has 20 years of experience with oiled wildlife, determined that the bird was completely covered with diesel oil. The White-tailed Tropicbird came in from Maui, as a chick displaced from its cliffside nest, and was cared for until it was able to fledge. Two of the three Wedge-tailed Shearwaters were also brought to HWC from Maui as chicks displaced by human activity. All three boobies were from Kaua'i and had impact injuries. With the assistance of Cascadia Research Collective, Kaua'i Save our Shearwaters program, and the

Maui Nui Seabird Recovery Project, seabirds were rescued and transported to the HWC wildlife hospital for treatment. The HWC retail store celebrated its grand opening in January 2014. Proceeds from the retail store go directly back into funding the wildlife hospital and HWC's conservation programs. HWC also completed the master plan for its public exhibits with fundraising for fabrication and installation to begin in 2015.

André F Raine updates the current work of The Kaua'i Endangered Seabird Recovery Project (KESRP), which is a project of the Division of Forestry and Wildlife (DOFAW), administered through the Pacific Studies Cooperative Unit of the University of Hawai'i. Formed in 2006, the project focuses primarily on the three imperiled seabirds found on the island of Kaua'i – Newell's Shearwater, Hawaiian Petrel (*Pterodroma sandwichensis*) and Band-rumped Storm-Petrel (*Oceanodroma castro*). The majority of work conducted by KESRP in 2014 was funded through either a State Wildlife Grant or the KIUC (Kaua'i Island Utility Cooperative) Short-term Habitat Conservation Plan. Auditory survey work continued in previously un-surveyed areas, and new seabird colonies of all three species were discovered. These included a large colony of Hawaiian Petrels and Newell's Shearwater in the middle of Hono o Na Pali Natural Area Reserve (NAR) and an area on Lehua Islet where Band-rumped Storm Petrels were exhibiting behavior consistent with a breeding colony. KESRP also continued to monitor two seabird colonies in conjunction with introduced predator control and habitat management work. The first site is the Upper Limahuli Preserve, in collaboration with the National Tropical Botanical Gardens (NTBG), where a total of 23 Hawaiian Petrel and 57 Newell's Shearwater burrows have been identified to date. The second site involves three management areas (Pihea, Pohakea, and North Bog) within the NAR, in collaboration with NAR staff. Here a total of 134 Hawaiian Petrel and 19 Newell's Shearwater burrows have been identified. Part of the management in these areas involved considering different arrays of Good Nature automatic rat traps and assessing how they affected rat predation and visitation rates at known seabird burrows. Monitoring at these sites continued to focus on both song meters and active burrow monitoring. Remote cameras at a subset of monitored burrows continued to provide information on predator interactions, seabird behavior, and fledging activity.

KESRP has also been looking into the impact of powerline collisions and light attraction on these seabird species. The use of song meters continues to be a promising technique for recording the sound of birds hitting power lines, and validation of this technique is progressing. Validation focused on outside observers using near-IR lights as well as radar and ground searches in conjunction with song meters. Song meters were also deployed in lowland areas for the first time, with modifications made to microphones to account for traffic noise. As well as monitoring powerline strikes, KESRP worked with KIUC on a pilot project to assess new techniques to prevent strikes, with work initiated on the use of experimental lasers and lights to make lines more visible to flying birds. This will continue in 2015. Lastly the Nihoku Ecosystem Restoration Project at the Kilauea Point NWR entered a new phase in 2014 with the completion of a predator proof fence in an area within which a colony of Newell's Shearwaters will be created using social attraction and artificial nest burrows. This is a collaborative effort among the Refuge, American Bird Conservancy, Pacific Rim Conservation, the National Fish and Wildlife Foundation, and KESRP. For more information on KESRP, see the website at:

http://Kaua'iseabirdproject.org/

or the Kaua'i Endangered Seabird Recovery Project Facebook page.

Melinda Conners (Ph.D. student, UCSC, and Nancy Foster fellow) has completed fieldwork for her dissertation at Tern Island, French Frigate Shoals, Northwestern Hawaiian Islands. She has been focusing on the diets and foraging ecology of Laysan and Black-footed Albatrosses (*Phoebastria nigripes*). She is on track to complete her dissertation in May 2015. **Scott Shaffer** and **Corey Clatterbuck** (M.Sc. student, SJSU) are continuing to study the foraging ecology of Laysan and Black-footed Albatrosses at Midway Atoll (in collaboration with **John Klavitter** [USFWS] and **Maura Naughton** [USFWS ret.]). Scott is also co-advising **Sarah Gutowsky** (Ph.D. student, DAL, Halifax, NS). Sarah is comparing the foraging ecology of albatrosses from multiple colonies in the Northwest Hawaiian Islands.

Morgan Gilmour (Ph.D. student, UCSC) has begun sampling Great Frigatebirds (*Fregata minor*), Masked Boobies (*Sula dactylatra*), and Brown Boobies (*S. leucogaster*) for contaminants in the Pacific Islands. Her dissertation research focuses on foraging ecology and contaminant loads of these species, and she has deployed GPS tracking devices as one tool to study foraging ecology. She completed field work at Palmyra Atoll in the summer of 2014 and plans to obtain samples from the Northwestern Hawaiian Islands later this year in order to make population-level comparisons of contaminants and foraging ecology throughout the Pacific. Morgan was recently awarded an EPA-STAR fellowship to focus on contaminants in tropical seabirds.

Bryan Costa, **Brian Kinlan** and **Arliss Winship** of the National Centers for Coastal Ocean Science (NOAA NCCOS) Biogeography Branch are developing statistical models and predictive maps of marine bird species around the Main Hawaiian Islands from near shore to the U.S. Exclusive Economic Zone. The models and predictions will support offshore renewable energy planning and other ecosystem-based management needs in the region. Multiple at-sea transect surveys are being compiled from many different federal and academic organizations, and will be integrated with multiple physical and biological environmental predictors. Deterministic models will be used to produce seasonal,

high-resolution maps of estimated long-term average relative occurrence and abundance for several marine bird species around the Main Hawaiian Islands. The final report and data products will be available in summer 2016. This project is funded by BOEM, Pacific Region. (Also see description of related efforts in the U.S. Atlantic under "Non-Pacific United States," below)

NON-PACIFIC UNITED STATES

Compiled by Iain Stenhouse

PELAGIC SURVEYS

Funded by the Department of Energy (DOE), the Biodiversity Research Institute (BRI) completed its second year of broad-scale baseline surveys for seabirds, marine mammals, and sea turtles in the mid-Atlantic region, using a combination of aerial surveys (employing high-definition videography) and boat-based surveys. High-definition video has proved to be an effective method, capturing distribution and abundance information on a broad range of marine taxa in a single survey platform. Among others, **Iain Stenhouse** (BRI), **Richard Veit** (City University of New York [CUNY]), and **Beth Gardner** (North Carolina State University [NCSU]) are co-PIs on the broader project.

Richard Veit and colleagues **Tim White**, **Lisa Manne**, **Simon Perkins**, **Tom Brown** and **Danielle Fibikar** (CUNY) have completed or are completing boat surveys for seabirds off southeastern Massachusetts (Massschusetts Clean Energy Center, BOEM) and off Delaware-Virginia (DOE; see project above), to gauge possible impacts of offshore wind energy projects. They are pursuing continuing funding to support shipboard surveys of the U.S. continental shelf aboard NOAA research vessels for a project begun in 2007, and are also continuing research on variation in winter abundance of alcids off the U.S. East coast and its relation to oceanic climate.

MODELING EXERCISES

Building on their past work in the New York Bight and Mid-Atlantic, **Brian Kinlan** and **Arliss Winship** (NOAA NCCOS) are developing statistical models and maps of marine bird species in the U.S. Atlantic from the Straits of Florida to Maine, from near shore to the U.S. EEZ, to support offshore renewable energy planning and other ecosystem-based management needs. They are using 75 at-sea transect surveys spanning 1978–2014 from the USGS/USFWS Atlantic Seabird Compendium Database and a large database of oceanographic and environmental predictors. Machine-learning models are being used to produce seasonal, high-resolution (2km) maps of estimated long-term average relative occurrence and abundance for approximately 50 marine bird species. This project is funded by BOEM. Results from Phase I of this modeling effort will be available in mid-2015, and the final report and data package will be available in 2016 at http://coastalscience.noaa.gov/. Kinlan and Winship are also continuing BOEM-funded work on statistical guidelines for surveys and monitoring to detect marine bird "hotspots" and "coldspots," to be completed in 2016.

Brian Kinlan, **Arliss Winship**, **Pat Halpin** (Duke University), **Mike Fogarty** (NOAA NMFS), and **Earvin Balderama** (Loyola University) are leading a Marine Life Data Analysis Team (MDAT) to provide scientific information on the distribution of marine birds, marine mammals, and fish to the Northeast Regional Planning Body (RPB). The RPB is conducting the first formal regional marine spatial planning process in the U.S. The MDAT is working with the Northeast Regional Ocean Council to provide models, maps, and spatial analyses to support marine spatial planning in the Northeast region. More information can be found at http://neoceanplanning.org/. Kinlan is chairing the Avian Working Group and all interested marine bird experts are welcome to join (brian.kinlan@noaa.gov).

COLONY-BASED STUDIES

Steve Kress and **Paula Shannon** (National Audubon Society's Seabird Restoration Program [NAS-SRP]) continued long-term monitoring of breeding seabird populations in the Gulf of Maine, focusing on diet studies, productivity, growth, and populations of terns, Atlantic Puffins, Razorbills (*Alca torda*), and Black Guillemots (*Cepphus grylle*). To track winter movements of Atlantic Puffins, 15 geolocators were deployed on breeding adults. A collaborative program with NOAA began, using GPS tags to learn about summer foraging of Atlantic Puffins. In partnership with 'explore.org,' the NAS-SRP deployed five HD cameras streaming live video of nesting puffins, terns, guillemots, and Osprey (*Pandion haliaetus*) to the internet. Audubon's internship training program continued, with interns from the United States, Mexico and Aruba.

Iain Stenhouse (BRI) led a study of mercury exposure in four focal species breeding at colonies in the Gulf of Maine, including the Common Eider, Leach's Storm-Petrel, Double-crested Cormorant and Black Guillemot. They compared contaminant levels found in 2013 with previous results from 1998–2006, and found significant increases in mercury in all species, except the Leach's Storm-Petrel, which was high to begin with and remained stable. This study was funded by the Maine Outdoor Heritage Fund, and supported by Maine Department of Inland Fisheries and Wildlife and NAS-SRP.

Ernst Rupp and **Esteban Garrido** (Grupo Jaragua) led fieldwork to locate and monitor 47 active Black-capped Petrel (*Pterodroma hasitata*) nests during the 2014 breeding season in the area of Loma del Toro, Dominican Republic and Morne Vincent, Haiti. Fledging success was approximately 75 % at both locations. Causes of nest failure included animal and human predation, egg abandonment. In Haiti, people searching for wild yams in the nesting area find nests accidentally. Grupo Jaragua followed up

on a petrel nesting areas on the northern escarpments of the Massif de la Selle, Haiti, identified by radar surveys in 2013. Of the 18 accessible nests, 11 (61%) had chicks. This area is highly threatened by conversion to grazing. Without immediate intervention, this important petrel nesting area may soon be destroyed.

TRACKING STUDIES

Linda Welch (USFWS) and colleagues at Maine Coastal Islands National Wildlife Refuge continue their efforts to document colony attendance rates and foraging behavior in Common and Arctic Terns. They are using nanotags (coded radio tags) and automated receiving stations on colonies and nearby islands to try and document the location of foraging habitat. The Refuge works with a network of partners to deploy "homemade" receiving stations that cost about 15% of the commercial receivers. The receiving stations collected data 24 hours a day, and collected over 3.5 million records. The data allow them to examine foraging flight direction, the number and duration of foraging trips, compare foraging effort between incubation and chick rearing, and then monitor the birds' departure from the colonies at the end of the season. Several hundred receiving stations deployed from Atlantic Canada to the mid-Atlantic region will also help track the terns and hundreds of other tagged passerines, shorebirds, raptors, and bats during their migrations.

Iain Stenhouse, **Lucas Savoy**, **Carrie Gray** (BRI), **Bill Montevecchi** (Memorial University [MUN]), and **Alicia Berlin** (USGS) continue to collaborate on a satellite telemetry study of diving bird species wintering in the mid-Atlantic region. Funded by BOEM, and coordinated by USFWS (**Scott Johnson** and **Caleb Spiegel**), this study has been highly successful in tracking the movements of three focal marine bird species: Northern Gannets (*Morus bassanus*), Red-throated Loons (*Gavia stellata*), and Surf Scoters. Birds are caught at sea in winter to specifically examine their winter use of the mid-Atlantic continental shelf area and their migratory movements in relation to the federally-designated Wind Energy Areas off the eastern seaboard. The project team is preparing for a fourth year of capture and tagging and trials of experimental harness attachments, in early 2015.

Under the guidance of **Patrick Jodice** (USGS Cooperative Research Units and Clemson University [CU]), research continued on seabird colonies and shorebirds in South Carolina, the Gulf of Mexico, and the Caribbean.

Juliet Lamb (Ph.D. student, CU) recently completed the second season of fieldwork in a project examining the spatial ecology of Brown Pelicans breeding in the northern Gulf of Mexico. The project, funded by BOEM, is examining differences in diet, energetics, contaminant loads, reproductive success, and habitat use between pelicans breeding in regions with varying levels of oil infrastructure and onshore development. In addition to deploying an additional 25 satellite tags on adult pelicans, bringing the total to 85 adults equipped with transmitters, Lamb and research assistant **Yvan Satgé** (Research Associate, CU) fitted 300 nestlings at colonies along the Texas coast with green field-readable bands. To improve the chance of re-sighting dispersing juveniles, the team has created a website (http://projectpelican.weebly.com/) where birders can report sightings of color-banded individuals. Please keep your eyes open for green-banded pelicans, and make sure to report any sightings using the web form!

Caroline Poli (M.Sc. student, CU) continued research on GPS tracking and foraging patterns of Masked Boobies in Mexico and is analyzing movement data from 40 satellite-tagged Brown Pelicans that were captured near Charleston, SC in December 2010. The focus of the research is to examine individual site fidelity and timing of migration and investigate the extent to which pelicans use regional parks and protected areas. The CU lab also has expanded tracking efforts on seabirds in the Atlantic. The Tracking Atlantic and Caribbean Seabirds (TRACS) program is now active in The Bahamas, Jamaica, Dominican Republic, Mexico, British Virgin Islands, St. Eustatius, and Trinidad & Tobago. Details can be found at www.atlanticseabirds.org. Along with efforts to track Audubon's Shearwater (*Puffinus lherminieri*), White-tailed Tropicbird and Masked Booby, they are now also tracking Red-billed Tropicbird (*Phaethon aethereus*), Magnificent Frigatebird (*Fregata magnificens*), and Black-capped Petrel.

George Wallace of the American Bird Conservancy (ABC) reports that, in April 2014, satellite transmitters were deployed on three breeding adult Black-capped Petrels trapped in Sierra de Bahoruco National Park, Dominican Republic. The project is a collaboration of ABC, Grupo Jaragua, USGS, CU, and Instituto Tecnologico de Santo Domingo. These are first Black-capped Petrels ever tracked using any technology. Two tags provided position data for approximately 4.5 months and the third is still transmitting. The birds foraged almost exclusively in the southern Caribbean Sea during the chick provisioning period, entering Panamanian, Colombian, and Venezuelan waters. The tracking data apparently provide the first known records of the species for Panama and Venezuela. Post-breeding, the birds moved into Gulf Stream waters and adjacent North Atlantic waters east of the Delmarva Peninsula. Single day flights have varied widely in distance, but a few have exceeded 450 miles. To view an interactive track map, see http://www.atlanticseabirds.org/bcpe-new.

Building on previous surveys in 2012 and 2013, Environmental Protection in the Caribbean, Grupo Jaragua, and Société Audubon Haiti also used marine radar to determine Black-capped Petrel flight corridors and nest activity centers in various areas in Hispaniola during February and March 2014. Radar data was collected at 12 stations, almost entirely in areas not previously surveyed for petrels. A highlight was locating new petrel activity centers in Sierra de Neiba and the north slope of the Sierra de Bahoruco, Dominican Republic. These

data have already aided greatly in prioritizing locations for future field visits and nest searching.

OTHER STUDIES/NEWS

Conservation Metrics, Grupo Jaragua, and Société Audubon Haiti collaborated on acoustic monitoring of Black-capped Petrels on Hispaniola. Three calibration and several exploratory sites were surveyed for one-month periods. A new "high" density area was discovered at the exploratory site along the cliffs of Seguin, Haiti. During the 2014–2015 breeding season, Grupo Jaragua planned to re-deploy seven acoustic sensors at calibration and exploratory survey sites starting in September 2014.

Jeff Spendelow (USGS) continues to coordinate a long-term cooperative research project on the metapopulation dynamics and ecology of the endangered northwest Atlantic breeding population of Roseate Terns (*Sterna dougallii*). The project includes working with collaborators to examine the temporal and geographic variation in staging site use in SE Massachusetts by hatch-year birds.

Sarah Courchesne and **Julie Ellis** (SEANET) report that the *Field Guide to Beached Birds of the Southeastern United States* is finished and has gone to press! They would like to thank **John Stanton** of the USFWS Southeast Region Migratory Bird Program for making this possible. Please watch the SEANET blog for instructions for ordering your very own copy (http://seanetters.wordpress.com). The SEANET blog is generally good reading, too!

CANADA

Compiled by Ken Morgan

PACIFIC CANADA

Doug Bertram (Wildlife Research Division [WRD], Delta, British Columbia [BC]) worked with **Michael Janssen** (Canadian Wildlife Service [CWS], Ottawa, Ontario [ON]), **Jenna Cragg** (EC contractor, Nanaimo, BC), **Sean Boyd** (WRD, EC, Delta, BC), and veterinarian **Malcolm McAdie** (under contract with EC) to capture and attach solar-powered satellite transmitters (PTTs) to breeding Marbled Murrelets. Six birds were captured and fitted with PTTs in April 2014 near Hartley Bay, at the entrance to Douglas Channel (BC). Signals were obtained from five marked birds; unfortunately, four signals ended after two weeks, perhaps because the deployment was too early and moult had not yet been completed. One PTT continued to provide reliable signals throughout the spring and summer; and the data are consistent with breeding in the Giltoyees Inlet area. In late July, the bird moved out of the study area and headed to Alaska in August; by late September the bird was west of Kodiak Island, AK. Doug also worked with **Jason Duffe** (WRD, EC, Ottawa, ON) to film and photograph shorelines of three federal migratory bird sanctuaries on southern Vancouver Island, to categorize current shoreline status.

Alan Burger (University of Victoria [UVic]) is trying hard to be retired, but continues some work on the Marbled Murrelet including reviews, conservation and publishing.

Harry Carter (Carter Biological Consulting) conducted seabird projects mainly in California in 2014. Work in BC included a complete colony survey of the Strait of Georgia for Double-crested Cormorant, Pelagic Cormorant, and Brandt's Cormorant in June-July, led by **Trudy Chatwin** (BC Ministry of Forests, Lands and Natural Resource Operations [MFLNRO]), and with **Mark Drever** (CWS, EC), **Erica McClaren** (BC Parks, Ministry of Environment), and others. Harry noted that a complete cormorant survey of this region had not been conducted since 2000, and major changes in population size and distribution have occurred. Harry also conducted (with Erica McClaren) surveys of Pelagic Cormorant colonies in outer Queen Charlotte Strait (the region has not been surveyed since the 1980s, and the population size appears to have declined), and worked with **Spencer Sealy** (University of Manitoba [UM]) and others on Ancient Murrelet records, historical seabird records, and alcid vagrancy. Lastly, Harry reported the following papers were published: (i) Carter, H.R., Lambert and Donnecke 2014. Breeding of Brandt's Cormorant at Mandarte Island in 2013. *Victoria Nat.* 70: 6–7; (ii) Sealy, S.G., Carter, H.R., Thomson, R.E., and Morgan, K.H. 2013. Movements of Ancient Murrelet family groups to northern Vancouver Island, British Columbia. *NW Nat.* 94: 209–226; and (iii) Sealy, S.G., Carter, H.R., Thomson, R.E., and Pearson, S.F. 2013. Far-south Ancient Murrelet family groups: long-distance movements or limited local breeding? *NW Nat.* 94:227-239.

Trudy Chatwin (BC MFLNRO) reported that she, along with **Monica Mather**, **Darryn McConkey**, **Connie Miller-Retzer,** and **Linda Sinclair** (all BC MFLNRO), has been working to establish Wildlife Habitat Areas (WHAs) for Marbled Murrelets in old growth forests on Vancouver Island and the BC central coast. According to Trudy, there are 53 proposed WHAs on the central coast and southern Vancouver Island awaiting decision, and 135 additional proposals in various states of consultation on the coast. In addition, Trudy and **Louise Waterhouse** (BC MFLNRO) are members of the Canadian Marbled Murrelet Recovery Team and participated in developing Canada's "Recovery Strategy for the Marbled Murrelet (*Brachyramphus marmoratus*)," June 2014.

Luke Halpin (Halpin Wildlife Research) has been working on bioacoustic techniques to monitor island-nesting seabird populations, with a current focus toward restoration of populations heavily affected by invasive predators on Pacific islands. His research focuses on bioacoustic monitoring of nocturnal seabirds and its utility to measure seabird colony attendance and population recovery following removal of invasive predators on islands. Luke has been working with Ancient Murrelets, Japanese Murrelets (*Synthliboramphus wumizusume*), Cassin's Auklets, Fork-tailed Storm-Petrels, Swinhoe's Storm-Petrels (*Oceanodroma monorhis*), and Leach's Storm-Petrels. Additionally, Luke has been

conducting at-sea seabird surveys off the west coast of Canada to assist **Ken Morgan** (CWS, EC) with identifying important marine habitats for pelagic seabirds.

Mark Hipfner (WRD, EC) reported that summer 2014 marked the 21st year of operation of the Centre for Wildlife Ecology's (CWE, Simon Fraser University [SFU]) seabird research and monitoring program on Triangle Island, BC. In addition to Mark, the 2014 field crew consisted of **Michael Arbeider** (BSc student, SFU), **Catherine Jardine** (Bird Studies Canada [BSC]), **Claire Mussells** (WRD, EC), **Katharine Studholme** (Ph.D. student, Dalhousie University [DAL]), and **Sarah Thomsen** (Ph.D. student, SFU). As in past years, the Triangle Island crew monitored breeding chronology and success, and related ecological parameters, in Cassin's Auklet, Rhinoceros Auklet, Black Oystercatcher (*Haemotopius bachmani*), and Glaucous-winged Gull. The main focus of the research effort in 2014 was Katharine Studholme's Ph.D. project, co-supervised by Mark and **Glenn Crossin** and **Sarah Iverson** (DAL). Katherine's project involves deploying geolocator (GLS) and global positioning system (GPS) tags on Cassin's and Rhinoceros Auklets on colonies widely dispersed along the BC coast. The Triangle Island crew, plus Glen Crossin, **Nate Clark** (M.Sc. student, Queen's University [Queen's]), **David Green** (SFU), **Joshua Green** (BSc student, University of British Columbia [UBC]), **Glen Keddie** (CWS contractor), **Elizabeth Krebs** (WRD, EC), **Christie Macdonald** (British Columbia Conservation Foundation [BCCF]), and **Strahan Tucker** (Department of Fisheries and Oceans [DFO]) deployed tags on Triangle, Pine, and Lucy islands, and on S'Gang Gwaay. Collaborators **John Elliott** and **Sandi Lee** (both Wildlife Toxicology Division, EC), and **Laurie Wilson** (CWS, EC) led field crews that deployed tags on Cleland Island and Frederick Island, respectively. In addition, Mark reported that several other research projects were carried out concurrently with the GLS deployments in 2014. **Katie Haman** (Ph.D. student, Marine Mammal Research Unit, Fisheries Centre, UBC) and Mark are leading a project to assess baseline health parameters in Rhinoceros Auklets, ahead of projected regional increases in industrial development. Mark, Strahan, and **Marc Trudel** (DFO), and other DFO collaborators, completed the third year of a joint EC-DFO project investigating the consumption of salmon (*Oncorhynchus* spp.) by seabirds in BC waters. And finally, Mark and **Moira Galbraith** (DFO) completed the sixth year of a project investigating spatio-temporal variation in the diets of forage fish of importance to seabirds in BC.

Ken Morgan (CWS, EC) continued to chair the Canadian Albatross and Shearwater Recovery Team, which includes **Louise Blight** (Procellaria Research & Consulting), **Peter Hodum**, **Jo Smith** (Birdsmith Ecological Research), and others. As well, Ken continued placing contract at-sea seabird observers on ships-of-opportunity off Canada's west coast, and continued to chair the Pacific Region - Seabird Bycatch Working group (with **Yuriko Hashimoto (CWS, EC)** and **Laurie Wilson**, **Mark Hipfner**, as well as several DFO employees). In addition, Ken participated in meetings of the Seabird Bycatch Working Group and the Population and Conservation Status Working Group at the 8th meeting of the Advisory Committee of ACAP (Agreement on the Conservation of Albatrosses and Petrels) in Punta del Este, Uruguay in September 2014.

In fall of 2013, **Bernard Schroeder** (Bernard K Schroeder Consulting [BKSC]) and **Jenna Cragg** (subcontracting with BKSC) completed a density analysis of select seabird species: Western Grebe (*Aechmophorus occidentalis*), Surf Scoter (*Melanitta perspicillata*), California Gull (*Larus californicus*), Common Murre, Marbled Murrelet and Rhinoceros Auklet from vessel-based line transects conducted (in 2012 and 2013) in the Prince Rupert region of BC, for Aecom Environmental (Camarillo, CA). In 2014, Bernard was contracted by **Ian Parnell** (CWS, EC) to conduct Marbled Murrelet radar and vessel-based line transects in the Douglas Channel region of BC. Three Northern Mainland Coast long-term radar monitoring stations were visited by sailboat to provide additional abundance measures for population trend analysis and 470 km of transects were conducted between radar sampling locations. In addition, Bernard conducted Marbled Murrelet horizontal and vertical radar surveys for post-construction monitoring at the Cape Scott wind farm (as a subcontractor to Cooper-Beauchesne and Associates and Hemmera), investigating commuting behavior and flight heights in relation to wind turbines. He also conducted pre-construction murrelet horizontal and vertical radar surveys around Aristazabal Island (BC) by sailboat for a proposed wind power project (for Sea Breeze Power Corporation, Vancouver, BC). Modelled Marbled Murrelet habitat areas were also ground-truthed on shore and from the water. Bernard conducted murrelet inland forest surveys along areas of potential nesting habitat intersecting a proposed gas pipeline looping project between Kitimat and Terrace (BC) for **Brent Matsuda** (Aecom Environmental). And last but not least, Bernard continued as a member of the Canadian Marbled Murrelet Recovery Team.

Jo Smith reported that she is continuing her work on marine spatial planning in the Pacific Ocean and globally. In January 2014, she began working with TNC Canada (an affiliate of The Nature Conservancy, USA) to manage the global marine spatial planning program. The Nature Conservancy was asked to facilitate and lead a marine spatial planning program in the Seychelles, and Jo is the lead scientist for this project. Seabirds and ecological processes that support these populations are important components of marine plans in the Seychelles and elsewhere, including for marine protected area network designs. Jo is developing a community of practice for marine spatial planning, and studying the opportunities and challenges that marine protected areas present for multiple objective planning. Jo also is involved in marine planning in Indone-

sia, the Gulf of California, and the Caribbean. In June, Jo completed her work with the "Marine Planning Partnership for the North Pacific Coast," and the marine plans should be completed by October 2014. Jo continues as a member of the Canadian Albatross and Shearwater recovery team (along with **Ken Morgan**, **Louise Blight**, **Peter Hodum**, and others), and with the SeaDoc Society.

Laurie Wilson coordinated the CWS seabird colony monitoring program in 2014, revisiting permanent plots at the Rhinoceros Auklet, Cassin's Auklet, and Tufted Puffin colonies on Triangle Island. Field crew consisted of Laurie, **Rhonda Millikin** (CWS, EC), **Michael Rodway** (CWS contractor), and **Joshua Green**. Some transects were resurveyed on Susk Gwaii (Frederick Island, Haida Gwaii, BC), and occupancy rates for Cassin's Auklets and Ancient Murrelets were determined. The field crew included Laurie, **Glen Keddie**, and **Moira Lemon, Dan Shervill**, and **Yuriko Hashimoto** (all CWS, EC). Laurie also completed the second of a three-year study to better understand the timing and movement of Ancient Murrelets that breed in BC. Four GLS tags deployed in 2013 on breeding Ancient Murrelets on George Island and Susk Gwaii were recovered. Additional GLS tags were deployed on 150 breeding Ancient Murrelets at four colonies (George Island [75 tags], Susk Gwaii [75], Reef Island, [25], Hippa Island [25]). Field crew included Laurie, Glen Keddie, Moira Lemon, Dan Shervill, Yuriko Hashimoto, **David Cunnington** (CWS, EC), **Jake Pattison** (Laskeek Bay Conservation Society), and **Tony Gaston** (EC). Finally, Laurie continued with her assessment of seabird bycatch in commercial salmon gillnet fisheries. Reports of bird entanglements from DFO test fisheries with observer programs and bycatch events reported by fishers were tallied; these data will be used to derive seabird bycatch estimates.

ARCTIC CANADA

Jennifer Provencher (Ph.D. student, Carleton University [CU]) provided the following update of work in northern Canada. Once again EC ran the long term monitoring program at East Bay Island, northern Hudson Bay (Nunavut [NU]). Although Common Eiders (*Somateria molissima*) are the primary species studied, other birds researched included King Eiders (*Somateria spectabilis*) and Herring Gulls (*Larus smithsonianus*). The team included **Grant Gilchrist** (WRD, EC), **Frankie Jean-Gagnon** (M.Sc. student, Université de Rimouski), **Nike Clyde** (M.Sc. student, CU), **Donald Hay-Pirie** (EC contractor), **Kevin Kelley** (M.Sc. student, University of New Brunswick [UNB]), **Rolanda Steenweg** (Ph.D. student, DAL), **Pierre Legagneux** (postdoctoral fellow, Université de Rimouski), and **Jenna Cragg** (EC contractor). Banding of King and Common Eiders was undertaken during the spring as the birds arrive on the island. Disease monitoring for avian cholera, stress physiology, and parasite and contaminants research were also undertaken. A new initiative using GPS tags to track early season movements of the Common Eiders was also undertaken this year to assess what local areas are used by the birds as they prepare for the breeding season. A small team worked on the Thick-billed Murre colony on Digges Island (NU) in 2014. Plot monitoring and the deployment of GPS units to track local movements of birds were the main research objectives. The team working on the murre cliffs included **Kerry Woo** (CWS, EC), **Michael Janssen** (WRD, EC), **Travis White** (Ph.D. student, CU) and **Mike Mariash** (EC contractor). Common Eiders were also surveyed in the area (by Grant Gilchrist and Nike Clyde) for a new study investigating how eiders shape the terrestrial environment of the islands through their presence during the breeding season. The Thick-billed Murre colony at Cape Graham Moore (NU) was visited again in 2014 by **Christie Macdonald** (EC), along with the crew of the S/V *Arctic Tern*. GPS units were deployed on the murres to determine their use of the surroundings waterways.

Sarah Wong (Acadia University [Acadia]) continues as a W. Garfield Weston postdoctoral fellow with **Mark Mallory** (Acadia), examining the marine distribution and abundance of seabirds in the North American Arctic and the factors driving their distribution. Collaborators include **Carina Gjerdrum** (CWS), **Ken Morgan**, **Svein Vagle,** and **Bill Williams** (both DFO). Sarah and colleagues published a paper identifying marine areas of high seabird density across the entire North American Arctic during summer (July and August) cruises, 2007–2012 (Wong, S.N.P., Gjerdrum, C., Morgan, K.H., and Mallory, M.L. 2014. Hotspots in cold seas: The composition, distribution, and abundance of marine birds in the North America Arctic. *J. Geophys. Res.* 119: 1691–1705).

ATLANTIC CANADA

Stephanie Avery-Gomm (EC) has been working with **Greg Robertson**, **Dave Fifield** (both EC) and **Carina Gjerdrum** managing two large projects related to understanding the risk and impact of the offshore oil and gas industry on seabirds, work funded by the Environmental Studies Research Fund (ESRF). The objective of the first project is to establish a baseline of seabird densities and distributions on the Labrador Shelf using ship-based surveys. Aerial pelagic seabird surveys carried out in collaboration with **Jack Lawson** (DFO) have also been conducted. The second ESRF project is an experiment to assess the accuracy of aerial and ship-based observations of dead seabirds at sea, as it pertains to oil spill response and quantifying associated seabird mortality. Contributors to these projects include **Laura McFarlane Tranquilla**, **Steven Duffy**, **Amy-Lee Kouwenberg**, **Sheena Roul,** and **Paul Regular** (all EC).

Dave Fifield (EC) recently analyzed 10 (of 22) GLS tags retrieved from Atlantic Puffins (*Fratercula arctica*) at Gull Island (NL) in 2014 to produce the first overwinter tracking of this species from eastern North American colonies. Preliminary analysis shows birds wintering either far offshore on the Grand Bank or moving south along the eastern seaboard of the U.S., as far south

as New Jersey or Delaware. Likewise, preliminary analysis of 2 (of 4) retrievals of Black-legged Kittiwake GLS tags showed birds wintering far offshore on the Grand Bank. This work was initiated and managed by **Greg Robertson**, and enjoyed contributions from **Michelle Fitzsimmons** and **April Hedd** (MUN), and **Amy-Lee Kouwenberg**, **Laura McFarlane Tranquilla,** and **Stephanie Avery-Gomm** (all EC).

Rob Ronconi (Acadia), working with **Phil Taylor** (Acadia), **Zoe Crysler** (M.Sc. student, Acadia), **Jess Stephens** (M.Sc. student, Acadia), and **Ingrid Pollet** (Ph.D. student, DAL), wrapped up a three-year study investigating seabird and landbird interactions with offshore oil and gas platforms in NS. This work included telemetry studies of Leach's Storm-petrels, Great Black-backed Gull (*Larus marinus)*, Herring Gull, Common Tern *(Sterna hirundo)*, and Arctic Tern (*S. paradisaea*). This group, along with partners **Rolanda Steenweg** (Ph.D. student, DAL) and **Mark Mallory**, also completed a colony census and dietary analysis for gulls and terns breeding on Sable Island, NS.

In 2014, **Rob Ronconi** and **Sarah Wong** continued their long-term banding and sampling of Great Shearwaters (*Puffinus gravis*) around Grand Manan Island, NB. In July 2014, Rob began temporary work with **Greg Robertson** analyzing tracking data.

Laura McFarlane Tranquilla successfully defended her Ph.D. thesis, "Ecological segregation of murres (*Uria lomvia, U. aalge*) during the nonbreeding season in the northwest Atlantic Ocean. The thesis focused on murres from Prince Leopold Island (NU), Coats Island (NU), Digges Island (NU) and the Minarets (NU), and from the Gannet Islands, and Funk and Gull Islands (NL). Laura also participated in population monitoring and GLS tracking research on Leach's Storm-Petrels, led by **April Hedd** and **Bill Montevecchi** on Baccalieu Island, NL. This work ties into a regional effort in NL to understand population trends and year-round marine distribution of storm-petrels, and includes the following EC collaborators: **Greg Robertson**, **Neil Burgess**, **Sabina Wilhelm**, and **Pierre Ryan** (all EC). Laura also reported that in January 2014, she accepted a position as the Atlantic Programme Manager with BSC in Sackville, NB.

OUTSIDE OF CANADA

Pat Baird (CWE, SFU) reported that she is continuing to work on the population status of various tern species (*Sternula*) in Hawai'i (HI), with other colleagues (**Scott Waddington**, Kona Wildlife; **Patty Szczys**, Eastern Connecticut State University [ECSU]; and **Tim Burr**, Poway, California [CA]). Pat is continuing her work at California State University (Long Beach, CA) on developing dyes suitable for seabirds, and she is also working with **Ron Ydenberg** (CWE, SFU) on data collected on Western Sandpiper (*Calidris mauri)* migration from Panama to Alaska. Pat continues to advise **Sarah Thomsen** (Ph.D. student CWE, SFU) who is completing her thesis on depredation of Scripps's Murrelet (*Synthliboramphus scrippsi*) on Santa Barbara Island, CA. As the PSG's Secretary for the last year, Pat has been posting on social media information pertaining to PSG, conservation issues, job openings, and links to relevant scientific publications. Pat gave a paper on conservation of Least Terns (*Sternula antillarum*) at the *Wildlife Society* conference (Pittsburgh, Pennsylvania, USA, October, 2014) and presented a poster on the HI team's tern work at the *Waterbird Society* meeting (La Paz, Mexico, November, 2014). Pat also noted that she is now on the Board of the *Waterbird Society*. Last but not least, Pat will be stepping down as the PSG's Secretary at the end of the 2015 annual meeting.

Heather Major (UNB) continued work on prospecting Crested Auklets at Gareloi Island, AK. Heather is currently supervising M.Sc. student **Christy Wails** (UNB), who successfully completed her first field season at Gareloi Island in 2014, researching the behaviour and movement of Crested Auklet prospectors at Gareloi Island.

LATIN AMERICA

Compiled by Annette Henry

CHILE

As a corresponding member of the Pacific Seabird Group since 2012, **Cristián G. Suazo** (Justus Liebig University) continues to work at sea with artisanal and industrial fisheries in the productive Humboldt Current system. His work with seabird conservation in Chile includes participation in the Albatross Task Force-Chile (ATF-Chile) Project. Cristián continues his involvement with education by supporting and collaborating with Master's students from Chilean universities such as the Universidad de Los Lagos (Chile). Cristián's latest publication can be found in this issue of Pacific Seabirds.

ASIA & OCEANIA

Compiled by Kuniko Otsuki

HOKKAIDO, JAPAN

Yutaka Watanuki (Hokkaido University), his colleagues, and students continued monitoring at Teuri Island (west side of Hokkaido), which had a very poor breeding season in 2014. No Black-tailed Gulls (*Larus crassirostris*) laid eggs, the numbers of active nests of Japanese Cormorants (*Phalacrocorax capillatus*) and Slaty-backed Gulls (*L. schistisagus*) were smaller than in other recent years. No Rhinoceros Auklets chicks fledged, mainly because of starvation; anchovies (their major prey) did not appear to be available within foraging range of Teuri Island. They also visited Daikoku Island on the east side of Hokkaido to collect diet samples of Rhinoceros Auklets and deploy geolocators. At each island, a pair of White-tailed Sea-eagles (*Haliaeetus albicilla*) have fed on seabird fledglings for a decade or more, presumably affecting seabird breeding activities, and partly contributing to the decrease in the number of seabird nests on these islands.

KYUSHU, JAPAN

In April 2014, **Masayoshi Takeishi** (Kitakyushu Museum of Natural and

Human History) and **Hiroto Okabe** (Kyushu Environmental Evaluation Association) led an expedition to further evaluate the feasibility of restoring the habitat of the Japanese Murrelet and the Swinhoe's Storm-Petrel on Okinoshima and nearby Koyashima by eradicating Norway Rats (*Rattus norvegicus*) and Black Rats (*R. rattus*). Much assistance with obtaining funding and trip planning was provided by **Kuniko Otsuki** (Japanese Seabird Group). They are focusing on determining: (1) seasonal changes in rat numbers; (2) current breeding status of the Japanese Murrelet and Swinhoe's Storm-Petrel at Koyashima; (3) finding evidence of breeding by Japanese Murrelets at Okinoshima; and (4) collecting data for non-target species which would be affected by rat eradication, such as the Okinoshima-endemic subspecies of the Japanese White-toothed Shrew (*Crocidura dsinezumi*). In September, rats were widely distributed at Okinoshima. At Koyashima, spotlight surveys in nearshore waters at night in April confirmed continued colony attendance by small numbers of murrelets. Nine Swinhoe's Storm-Petrels were caught in mist nets, suggesting that some birds survived rat predation and may now breed at this island. At Okinoshima, small numbers of murrelets and one family group were observed during April spotlight surveys, further suggesting breeding at this island. Shrew traps (n = 100) were set at Okinoshima, but no shrews were caught. Extirpation of shrews may have occurred since last observation in July 1962. More surveys will be conducted in January and February 2015. Rat eradication at Okinoshima (95 ha) is feasible, but the steep cliffs (max elevation 254 m) necessitate the use of an aerial broadcast eradication technique. The sacred nature of the island, many native and endemic plant and animal species, a large colony of Streaked Shearwaters (*Calonectris leucomelas*), and heavy use by the fishing community, all require careful consideration.

TAIWAN

Simba Chan (BirdLife International [BLI] Asia Division) spent May to August on Tiedun Dao, Jiushan Islands, Zhejiang Province of China to monitor and study the restoration of a Chinese Crested Tern (*Thalasseus bernsteini*) breeding site. It was highly successful: high numbers of adults (at least 43), breeding pairs (at least 20), and fledglings (at least 13) were recorded. This is a joint project with the Marine and Fishery Bureau of Xiangshan County (Zhejiang, China), Zhejiang Museum of Natural History, the Hong Kong Bird Watching Society and OSU. They plan to band the terns in 2015. Chan will write several papers from the data collected this summer.

NEW ZEALAND

In fall 2013, **Rachel Buxton** (University of Otago) completed studies of the attraction of Grey-faced Petrel (*Pterodroma macroptera gouldi*), Fluttering Shearwater (*Puffinus gavia*) and Flesh-footed Shearwater (*Puffinus carneipes*) to social cues (call-playback). She also examined how remnant burrow-nesting petrel colonies recover after predator eradication and recently completed her Ph.D. thesis "Ecological drivers of seabird recovery after the eradication of introduced predators."

Retired seabird biologist **Sandy Bartle** created a database of his long-term (1970–1997) mark-recapture data for Westland Petrels (*Procellaria westlandica*) from their sole breeding site at Punakaiki, on the west coast of the South Island. These data were used in a survivorship model developed by **Christophe Barbraud** (Centre National de la Recherché Scientifique, France). **Sandy Bartle** has also summarized available information (especially his unpublished 1976 surveys) on the pelagic ecology of seabirds and whales of the Chatham Rise. The Chatham Rise is a large, relatively shallow area extending 1,200 km east of New Zealand to the Chatham Islands that coincides with the Subtropical Frontal Zone, exhibiting considerable complexity and turbulence. It is a productive zone that seasonally supports an estimated five million individuals of 52 seabird species, including four which are critically threatened and breed on the Chatham Islands. Over one million pairs of seabirds of 23 species breed on the Chatham Islands, including three albatross species (all effectively endemic) plus three endemic petrels and two endemic cormorants. Bartle's information will be used in a hearing in October 2014 by the New Zealand Environmental Protection Authority (EPA) of an application for a Marine Consent by Chatham Rock Phosphate Ltd. to undertake undersea mining on the Chatham Rise. This project will use new (largely untested) technology, and will be a precursor for other similar large marine mining projects in the Southern Ocean (e.g., off Namibia). The mining company has applied to the EPA for permission to mine 1.5 million tons of phosphate nodules annually for 35 years. The depth of the sea floor to be mined is 250–450 m. A drag-head and pump unit weighing around 350 tonnes will dredge the sea floor to a depth of 0.5 m and all excavated material including benthic organisms pumped up to the dredge. During this mining operation, about 300 million tons of unwanted fine silt and clay sediments will be excavated from the sea floor and sieved on board this vessel before being returned down a pipe to (nominally) 10 m above the sea floor. The vessel will be slowly moving ahead at about 0.7 km/hr. A large-scale sediment plume likely will be created, which may be dispersed over a considerable area and through the water column by vertical turbulence. For more information, see:

http://www.epa.govt.nz/eez/EEZ000006/EEZ000006_CRP_Non-tech_Summary_May_2014.pdf.

Unfortunately, no field surveys of marine mammals or seabirds of the Chatham Rise were commissioned by the mining company, and there are no published studies. Additional threats to seabirds will arise through attraction to the lights of this vessel, which will operate on a 24/7 basis. At present, the mining company plans to deal with this threat by "adaptive management," but research is necessary to test the effectiveness of various solutions proposed from elsewhere, such as the use of green lights.

NEW CALEDONIA

Ludovick Reneudet (Société Calédonienne d'Ornithologie), reported implementation of a program for controlling the spread of invasive species to the breeding colonies of the Gould's Petrel (*Pterodroma leucoptera*), an IUCN Vulnerable species. At present, there is only one known breeding colony in New Caledonia on the central mountain chain in the town of Paita. Other areas are only suspected to have Gould's Petrel colonies, but reproduction of petrels has never been confirmed for these areas. This petrel is heavily affected by introduced rats, feral cats, and pigs, as well as by habitat destruction (bush fires and opencast mining). Light-induced mortality is also of concern locally. A total of 28 boxes for rodent baits have been installed near petrel burrows with high reproductive activity. Breeding success is monitored in 150 burrows, using a burrow scope.

FIJI

Sia lisi Rasalato (BLI Pacific Secretariat) reported that, in July 2014, field biologists conducting surveys on Yaqaga Island (Bua Province, Vanua Levu) came across a specimen of the rare Tropical Shearwater (*Puffinus bailloni dichrous)* that was thought to breed there four decades ago. The specimen was found hanging from a tree by a local villager, **Akuila Wara**, who mentioned that he did not know this species (i.e., it was different from other seabirds he sees while fishing out at sea). Tropical Shearwaters have been observed at sea in Fiji, the South Pacific, and Indian Ocean, but are rarely seen on land. Even though a colony has not been confirmed in Fiji since 1980, a colony of Audubon Shearwaters (later divided into Tropical Shearwater and four other species) was found in 1978 by locals on Yanuca Island (off Beqa, Viti Levu). A specimen has not been collected in Fiji until 2014. Like those of the Fiji Petrel (*Pseudobulweria macgillivrayi*) and the Collared Petrel (*Pterodroma brevipes*), Tropical Shearwater nesting and breeding sites in Fiji have been under risk by invasive alien species (i.e., rats, cats, feral goats, mongoose, and wild dogs), resulting in decline over the decades. Not yet sufficient for IUCN Vulnerable status, the Tropical Shearwater is still evaluated as IUCN Least Concern. These species also face many other threats such as deforestation and habitat destruction through bush fires, human encroachment, and agricultural diversification. These factors have contributed to the extirpation of these seabird species from many breeding sites in Fiji and in the Pacific. Every Pacific Island country is working relentlessly to reduce such impacts.

Tuverea Tuamoto (NatureFiji-MareqetiViti) reported that three years after the BirdLife International Fiji Programme, NatureFiji-MareqetiViti and the National Trust of Fiji eradicated rats and goats from Monuriki and Kadomo (Mamanuca Group). These islands have now officially been confirmed rat- and goat-free. The islands in the Mamanucas are popular amongst tourists for their pristine beaches and crystal clear waters. Monuriki and Kadomo are listed as Fiji's priority islands providing habitat for largest Fijian population of Wedge-tailed Shearwaters (*Puffinus pacificus)* and the endemic Fijian Crested Iguana (*Brachylophus vitiensis*). Initial signs of ecosystem recovery include rapid recovery of the dry vegetation, significant numbers of land birds, and an increase in seabird burrows. Among the positive changes recorded since 2009, a Banded Rail (*Hypotaenidia philippensis*) was observed on Monuriki, which had not been previously observed.

Poasa Qalo (NatureFiji-MareqetiViti) reported progress with controlling rats and cats at the most well documented colony of Collared Petrel (Navukailagi – 65 known burrows) on Gau Island. The Field Officers have placed rat stations and cat traps around the colony, visited weekly for monitoring and re-baiting. Fewer burrows were active in the 2014 breeding season (March-August), but 16 young fledged. Predators remain a problem and, despite control efforts, dead adults were found that were suspected cat predation. There was no petrel activity at two very small colonies (Qarani and Nawaikama). With the Fiji Petrel breeding season suspected to begin in August, the focus is now on dog search patterns and audio detection to help identify breeding locations.

COOK ISLANDS

Kelvin Passfield (Te Ipukarea Society) reported successful biosecurity training at Rarotonga by the Pacific Invasive Initiative and supported by BLI Pacific Secretariat. The one-week workshop provided basic training to the Suwarrow field rangers about biosecurity risks, prevention and the aim of developing a formal biosecurity plan for Suwarrow. The field rangers will spend six months on the island as caretakers, responsible for managing wildlife and making sure no one takes animals or plants ashore or removes local wildlife. They will also collect any litter washed up or left behind by visitors. Suwarrow is a popular landfall for sailboats because of its natural beauty and isolation. It is home to thousands of seabirds and is recognized as an Important Bird Area because of its large populations of Sooty Terns (*Onychoprion fuscatus*), Red-tailed Tropicbirds, and Lesser Frigatebirds (*Fregata ariel*). The atoll is uninhabited but has rats and cats. A rat eradication program was carried out last year in a collaboration between National Environment Services of the Cook Islands and Birdlife International.

FRENCH POLYNESIA

Sia Rasalato (BLI) reported that a survey in April 2014 confirmed the universal presence of Pacific Rats (*Rattus exulans)* on Temoe Atoll in the Gambier Islands. The atoll was inhabited four decades ago and cats (number unknown) were introduced to control the increasing rat population. These did not deter rats from spreading to all the other smaller islands within the atoll. At least nine species of seabirds breed on Temoe atoll, including regionally significant Murphy's Petrel *(Pterodroma ultima)* (the largest colony in French Polynesia), Red-tailed Tropicbird, Red-footed

Booby, Masked Booby, and White Tern (*Gygis alba*). A landowner and stakeholder consultation was organized by La Société D'ornithologie De Polynésie to gain support from the landowners of Makaroa, Kamaka, Manui and Temoe. The consultation resulted in an agreement formally approving and pledging their support for eradication of rats from these four islands. A local conservation group may be established for this and other purposes in the Gambier Islands.

TROPICAL SOUTH PACIFIC (provided by Stefan Garthe)

Alex Bond, **Steffen Oppel** (Royal Society for the Protection of Birds [RSPB]), and **Mike Brooke** (University of Cambridge) are preparing a 6-month expedition to Henderson Island (Pitcairn Islands) to conduct research on bait acceptance and uptake rates of invasive rats on Henderson. In 2011, a rat eradication on Henderson failed, presumably because not all rats consumed the poison bait. More research is now needed to investigate whether the abundance of coconut and pandanus fruits on the island (which provide abundant food for rats) poses an insurmountable problem for further eradication attempts. Eradicating rats is necessary to safeguard the endemic Henderson Petrel (*Pterodroma atrata*) from extinction.

EUROPE & AFRICA

Compiled by Stefan Garthe

NORTH ATLANTIC AND MEDITERRANEAN

Benjamin Metzger (BirdLife Malta) and **Steffen Oppel** used mistnets on the small island of Filfla (6 ha, Malta) to band European Storm-Petrels (*Hydrobates pelagicus*) during the summer of 2013 and 2014. Using various mark-recapture approaches, they estimated the size of the population at >25,000 individuals, which is more than twice as large as previously assumed.

SOUTH ATLANTIC

The Ascension Island Government, in collaboration with the Universities of Exeter (UK), **Julia Sommerfeld** (Research and Technology Centre, Büsum Germany) and RSPB (**Steffen Oppel** and **Mark Bolton**) tracked 30 Ascension Frigatebirds (*Fregata aquila*) with PTTs from March through August to examine within-individual foraging site fidelity and compare these data to GPS tracking data from 2013. These data, together with tracking data of other birds and seaturtles, are used to advocate for a 200 nm radius no-take zone ocean sanctuary around Ascension.

Annalea Beard and the Marine Section of the Environmental Management Directorate (St Helena Government), supported by **Steffen Oppel** and **Mark Bolton** (RSPB) tracked Masked Boobies and Red-billed Tropicbirds (*Phaethon aethereus*) with GPS loggers from breeding colonies on St. Helena to identify offshore foraging areas. The data show markedly different foraging strategies than Masked Boobies on neighbouring Ascension, despite similar tropical waters.

The Ascension and St. Helena Governments, in collaboration with **Steffen Oppel, Mark Bolton**, **Will Miles** (all RSPB), **Rebecca Taylor**, and **Vicki Friesen** (Queen's) initiated field work to clarify the taxonomy of Band-rumped Storm-Petrels nesting on Ascension and St. Helena. A mark-recapture study was initiated on Egg Island (St. Helena) to estimate adult survival and population sizes during the hot and cold breeding season. Storm petrels were captured in June and July 2014 to take blood and feather samples for genetic analysis. Passive acoustic recorders were deployed along the coastline of Ascension and St. Helena to document the occurrence of storm-petrels at mainland cliffs throughout the year, and to develop an acoustic index for long-term population monitoring.

Alex Bond recently joined RSPB, and now works with **Steffen Oppel, Richard Cuthbert** (now WCS, Papua New Guinea), **Peter Ryan** (Percy Fitzpatrick Institute for Ornithology, South Africa), and **Maria Dias** (BLI) to collate 10 years of tracking data for eight species of globally threatened seabirds to identify potential marine protected areas around the Tristan archipelago in the South Atlantic.

Alex Bond and **Peter Ryan** headed out to Tristan da Cunha and Gough Island in September 2014 to conduct a census of the Atlantic Yellow-nosed Albatross (*Thalassarche chlororhynchos*) population. Although the species is globally endangered, and Tristan da Cunha harbors >50% of the global breeding population, no census had been performed on Tristan da Cunha since 1974.

REPORTS OF PSG OFFICERS

CHAIR'S REPORT FOR 2013

Doug Forsell

My tenure as Chair in 2013 was both challenging and quite interesting. As I suppose happens with most chairs, I had a long list of things I wanted to accomplish. Some were completed; others fell by the wayside as other issues arose. The EXCO held two teleconferences, one in June and the other in November. While I aimed for two-hour calls, they ended up closer to three hours, and we still did not get everything accomplished.

Financial issues have dominated a lot of my time and even more time of Lindsay Young, our Treasurer through 2013, who worked diligently to pull our records together and bring us into compliance on several tax issues. A non-PSG member began looking into our tax filings and other paperwork required for nonprofit organizations, and pointed out several deficiencies over the past seven years. Lindsay and our accountant have now resolved these issues, and they should remain settled because Lindsay has incorporated these required annual filings in the description of duties and procedures of the Treasurer.

Since our fiscal year now begins in October, it seemed logical to spend the majority of the fall teleconference passing the budget, which was traditionally done during the EXCO meeting prior to the annual meeting. I recommend that budget passage in the fall be continued; the budget should be approved at the beginning of the fiscal year. I also recommend we initiate use of internet conference software that would allow us to view the Treasurer's spreadsheet during the discussion.

Early in my tenure, after asking for volunteers to review what was then called the Marbled Murrelet Tree Climbing Protocol and only receiving a couple of suggestions that we contract out the review, I decided to review it myself, with a final review by Stan Senner. After many edits and a bit of education from a very patient Kim Nelson, we came up with a document and procedures that I think limit PSG liabilities while allowing the Marbled Murrelet Technical Committee to offer a course to train and certify tree climbers to locate Marbled Murrelet nests. If the course for tree climbers is held, we will purchase liability insurance for PSG on a reimbursable basis from the participants. Within this process I also reviewed our current insurance coverage. While we have adequate liability coverage for actions of the EXCO and for our annual meetings, I recommended and the EXCO approved the acquisition of a surety bond for up to $50,000 coverage for those handling PSG funds. This will be initiated after the new officers have taken office.

A big item in the spring was a request from the World Seabird Union to fund the deposit for the venue for the second World Seabird Conference, which will be held in South Africa in 2015. PSG still had $23,000 in funds from the first World Seabird Conference that we received as refund of the GST taxes. EXCO voted to use up to $23,000 for the deposit on the WSC II venue. Our agreement with WSU included several stipulations; these are detailed in Dave Irons' and Robb Kaler's WSU report in this issue of *Pacific Seabirds*. The stipulations were met, and we transferred the deposit to the World Seabird Union. Additionally, the outstanding funds from the first World Seabird Conference were paid to the World Seabird Union for the compilation of the World Seabird Colony Database; again, details may be found in Dave and Robb's report.

I've spent a large amount of time reviewing California nonprofit law, as has Vivian Mendenhall, and we realized that some of our procedures such as proxy voting of the EXCO were not in compliance with the law. Some changes need to be made to our Bylaws, and a committee of Pat Baird, Vivian Mendenhall, Stan Senner, and myself will undertake a comprehensive rewrite of the Bylaws reviewed by an attorney and ready for approval by the San Jose meeting.

We received the PSG Strategic Planning Task Force's recommendations at the June 2013 EXCO meeting. The Officers and Local Committee worked to implement some of the suggestions at the Juneau meeting and are working to incorporate them in the San Jose meeting. We discussed the recommendations at both the EXCO at the Members Meeting (formally called the Business Meeting) in Juneau, where we sought input from the membership.

In dealing with the membership's opinions on activities of the EXCO, I have become a real fan of online polls following the response we got from 159 members to a poll about future meetings. Pat Baird conducted online voting on Bylaws changes, and that was quite successful as well. We have purchased a one-year license to allow us to send polls to specific lists such as for elections, and to large groups of members and interested individuals such as we did for the meeting survey.

Another accomplishment of the Officers was to place designated funds for student travel and the Craig Harrison Conservation Fund in separate bank accounts, increasing our fiscal transparency. We also added electronic abstract submissions to our online annual meeting registration which saves time and will improve consistency in the future.

One project that I did not accomplish was pursuing the return of our deposit from the Makaha Resort (which went out of business prior to our 2012 meeting in Hawai'i) and money still owed to PSG by a contractor at the Long Beach meeting. It appears that we have little chance of recovering those funds.

TRANSITIONS

PSG could not operate without the contributions of its members and I would like to acknowledge three of our members in particular:

- Lindsay Young served as Treasurer for three years and did a stellar job of implementing recommendations from our audit and documenting

step-by-step procedures for meeting responsibilities and timelines that will make the Treasurer's job much easier in the future. She also initiated the RegOnline system for handling online membership renewals, meeting registrations, and abstract submissions –all improvements that are much appreciated by those organizing meetings.

- Pat Baird served as Elections Chair for over 20 years. Having been Elections Chair for a number of years, I can attest to the amount of behind-the-scenes work that goes into trying to find qualified candidates to run for office, and the panic that sets in when it's time to send out ballots and you still need an a candidate. Thanks, Pat, for keeping PSG running all those years.
- Vivian Mendenhall stepped down as editor of Pacific Seabirds after 14 years. She has almost single-handedly taken it from a newsletter into the age of electronic publishing and consistently produced a very professional, high-quality publication. As an Ex-officio member of the EXCO, she has also been our expert on Bylaws and the operations of the EXCO, and provided institutional memory so important to the functioning of an effective board.

I appreciated the opportunity to serve as Chair, and I hope I've been able to contribute to the Pacific Seabird Group.

SECRETARY'S REPORT FOR 2013

Pat Baird

This year has seen PSG's presence on the Internet explode. I created an official public Facebook page and Twitter account at the beginning of the year. As of 2 November 2014, we have 99 followers on Facebook and 101 followers on Twitter, and I am sure we will have more by the end of the calendar year. The week of 27-31 October, our Facebook page reached 283 people. I also created a chat room where PSG members and the general public can post news of their research as well as find ride-shares or room-shares for the annual meeting. This chat room now has 105 members. The Secretary has the discretion to remove people who abuse the system on any social media site. The PSG Facebook page is the official face of PSG and does not permit public posting. This page is mainly a means to highlight: (1) information about PSG; (2) information about the annual meeting and other related meetings that might interest people in the marine biology field; (3) information from the EXCO on relevant topics that have been discussed; (4) conservation topics covering broad fields of oceanography and marine biology; and (5) job and graduate school/internship information. The Twitter feed mimics the information on the Facebook page. I have also posted podcasts of radio programs where PSG members have been interviewed on various conservation topics. If we get enough "likes" on Facebook, we can boost the postings and get PSG a larger internet presence.

I have streamlined the minutes and highlighted in different colors the motions and the action plans so that people can see these immediately. I have brought the website up to date with postings of minutes and Bylaws, and you can read them now online. Note that the website will soon be completely updated with a new look and pages that are easier to navigate.

As Secretary, I am on the Elections Committee and have been helping get the Elections Coordinator up to speed on how to get out the ballot in the most efficient way using Survey Monkey. PSG purchased the more robust professional version, which returns statistics immediately and sorted any way one wants. Stephanie Avery-Gomm on the committee has been taking the lead on this.

I set up Turbobridge for PSG so that all conference calls and annual meetings of the EXCO are recorded and archived in case anyone has any questions about the minutes or what the EXCO decided at any conference call or meeting. In addition, this service is a low-cost alternative to the officers using their agency or business conferencing capabilities, as had been common practice.

Finding a venue for the 2015 meeting was a challenge, and I corresponded with the people in the Waterbird Society to try to set up a joint meeting with them in La Paz, Mexico (where they met in November, 2014). Unfortunately, there was not enough support from EXCO to do this mainly because three of the last four annual meetings have been in places that are difficult and expensive to get to, and the feeling was to bring the 2015 meeting closer to PSG's core—the west coast corridor of the contiguous United States. With this mandate, I then helped the search committee to find, and obtain quotes from, two venues for the 2015 meeting, including the University of San Francisco's Mission Bay Convention Center in downtown San Francisco and the South San Francisco Conference Center, five minutes from the San Francisco airport and 15 minutes from San Francisco.

Although the decision for the 2015 venue is the San Jose Airport Garden Hotel near the San Jose airport, with Scott Shaffer at San Jose State as local committee chair, I recommend the other two sites be considered for the next annual meeting in California. They both are relatively inexpensive, easy to get to, and have plenty of conference-type rooms. Likewise, the San Francisco Mission Bay site is not linked to having a block of rooms in high-end hotels, which

is one way that PSG can lose money. I found a variety of inexpensive but good hotels (TripAdvisor rated) near the venue, so cost for students would not be a factor.

The Waterbird Society is still interested in meeting with PSG at some point, so the EXCO is exploring various options for future joint meetings as well as joint meetings with the AOU, the IOC, and other societies that focus on marine biology or oceanography.

The Chair, the Vice-Chair for Conservation, and I have talked about developing a Strategic Plan, and we will work on ideas for that as much as time allows. The objective is to go forward in 2015 with a plan of growth and development for PSG. We have as a template the excellent Strategic Plan of the Waterbird Society, so we will not have to reinvent the wheel.

The need to create a PSG archive center managed by an Archivist has become clear. Discussion in the EXCO recently between older and newer members of PSG on various critical topics made it apparent that many of the newer members were unaware of some policies, planning, or discussions that developed prior to their joining PSG. Sometimes ideas are proposed today that have been discussed previously at great length and in much detail among the EXCO members, and we have no formal "institutional memory" of those ideas, discussions, and outcomes. Likewise, I have two boxes of PSG archival material that were sent me by former PSG secretaries Beth Flint and Lora Leschner, and these should be organized and archived somewhere. Before my tenure at PSG is over, I hope we will have created an Archivist position and found a place where we can store not only the hard copy archival material but also old copies of *Pacific Seabirds* and the raw minutes and recordings of all EXCO conference calls and annual meetings.

It has been good moving PSG into the 21st century, and I hope that all of the new ideas and things that I have created will help members in the future.

PSG FINANCIAL REPORT FOR THE FISCAL YEAR ENDING ON SEPTEMBER 30, 2014

Lindsay Young (outgoing) and Christine Ogura (incoming) Treasurers

SUMMARY

The closing of FY14 ended with a gross income of $101,020.76 and expenses of $115,358.48, reflecting a deficit of $14,337.12. The approved 2014 budget anticipated this deficit as there were unexpended carryover funds from FY13 (i.e., expenses budgeted for the 2013 budget that were expended during 2014). These funds were not reflected in the income section of the FY14 budget (but were adjusted for in the final accounting). Despite ending the year in a deficit, the financial health of the organization overall is solid. Current assets are sufficient to cover the deficit and still provide for five years of core operating expenses (see general fund account).

Minor accounting procedural items associated with the annual meeting were changed in order to better reflect the true cost of running the meeting; in the past these items have been identified as general PSG operating expenses and not as a separate annual meeting budget. These included re-labeling the annual meeting expenses in the accounting software. There were also several expenditures that were approved at the Juneau Executive Council meeting that were not identified in the initial approved FY14 budget. Overall, financial reporting of this budget reflects a transition in accounting methods to better clarify the core operating costs for PSG. Therefore, most of the deficit is on paper only and a result of this change in accounting procedures. Consequently, some discrepancies exist between the previously approved budget categories and the actual income/expenses categories.

No funds from the endowment were used this fiscal year for publications; instead, these costs were taken out of excess general funds. This allows funds in the endowment account to continue to accrue interest. In 2009, the Executive Council developed a formula for identifying how much of the endowment was available for publication use. A principal of $100,000 was identified as a minimum amount to maintain (adjusted for current dollar value) and up to 6% of the endowment could be withdrawn annually. The current dollar value of $100,000 is $126,000. Therefore, by subtracting this amount from the current value of the endowment (which was $206,824 at the end of the fiscal year), the total amount available for publications is $80,824 (notwithstanding the 6% withdrawal rule).

Thank you to Lindsay Young for stepping into the Treasurer position at a critical time and helping to restructure PSG's financial foundation to ensure continued improvement in the management of the society's financial assets.

see pages 52-54 for financial tables

OVERVIEW OF FINANCIAL ACCOUNTS

General funds (which include operating costs) are kept in a checking account.

September 30, 2011 $102,079.24
September 30, 2012 $88,173.87
September 30, 2013 $79,506.16
September 30, 2014 $50,663.75

Our Endowment funds (Life Memberships and other specially designated monies), which are restricted for PSG publications, are kept in a mutual fund managed by Neuberger and Berman.

September 30, 2011	$119,879.53
September 30, 2012	$146,197.30
September 30, 2013	$180,320.39
September 30, 2014	$206,824.23

A PayPal account is used to accept membership payments, contributions, and other monies received by credit card.

September 30, 2011	$15,100.28
September 30, 2012	$5,882.93
September 30, 2013	$7,132.73
September 30, 2014	$2,555.26

Student travel awards savings account (restricted funds).

September 30, 2013	$5,216.24
September 30, 2014	$2,784.99

Craig Harrison conservation fund savings account (restricted funds).

September 30, 2013	$12,346.95
September 30, 2014	$3,342.88

Vivian Mendenhall maintained an account to facilitate the printing and mailing of Pacific Seabirds. However, with her retirement, this account has been closed and will revert back to the endowment fund.

September 30, 2011	$5,640.00
September 30, 2012	$1,090.15
September 30, 2013	$790.29
September 30, 2014	$738.04

Total Assets as of September 30, 2011 (includes restricted and non-restricted):	**$242,699.05**
Total Assets as of September 30, 2012 (includes restricted and non-restricted):	**$241,344.25**
Total Assets as of September 30, 2013 (includes restricted and non-restricted):	**$285,312.76**
Total Assets as of September 30, 2014 (includes restricted and non-restricted):	**$266,909.15**

REPORTS OF PSG OFFICERS

FY14 ACTUAL INCOMES AND EXPENDITURES

A. INCOME

	Budget FY14	Actual FY14 (9/14/14)	Surplus/ (Loss)
Unrestricted:			
Membership[1]:			
Annual Membership Dues	13,500.00	5,259.75	(8,240.25)
Life Membership Dues	900.00	250.00	(650.00)
General Fund Donations	300.00	60.00	(240.00)
Annual Meeting[2]:			
Juneau 2014	65,108.00	61,523.37	(3,584.63)
Student Travel (*Restricted*)	2,400.00	2,437.64	37.64
Travel Awards	0.00	0.00	-
Restricted:			
Endowment Fund (non-principal) - supports PSG publications	100.00	0.00	(100.00)
Publications:			
Marine Ornithology	400.00	100.00	(300.00)
Pacific Seabirds	1,500.00	390.00	(1,110.00)
World Seabird Conference 2 Donation (carryover from FY13)	23,000.00	23,000.00	-
World Seabird Conference Database (carryover from FY13)	8,000.00	8,000.00	-
A. TOTAL INCOME:	**$115,208.00**	**$101,020.76**	**$(14,187.24)**

B. EXPENSES: Administrative Operations

	Budget FY14	Actual FY14 (9/14/14)	Overspent/ (Underspent)
Accountant Fee[3]	2,000.00	1,759.53	(240.47)
Bank Charge (bank service charges)	2,250.00	281.04	(1,968.96)
Bookkeeper Fee		287.20	287.20
Chairs Discretionary Fund	2,000.00	0.00	(2,000.00)
Executive Council Meetings:			
Elections (e.g., postage, supplies, copying)		30.67	30.67
Telephone	200.00	387.75	187.75
Survey Monkey			
Government Registration Fees	150.00	185.00	35.00
Insurance premium	1,700.00	1,400.00	(300.00)
Legal Fees	0.00	273.16	273.16
Office Supplies			
Online Services:			
Website/Email (hosting)[4]		234.65	234.65
L-Soft (list-serve)[5]		2,600.00	2,600.00
PayPal Fee[6]		674.61	674.61
RegOnline Fee (membership and annual meeting)[7]		1,020.68	1,020.68
Postage for Mailings	100.00	92.00	(8.00)
PO Box Rental (annual)		96.00	96.00
B. TOTAL ADMINISTRATIVE OPERATIONS EXPENSES[8]:	**$8,400.00**	**$9,322.29**	**$922.29**

C. EXPENSES: Society Services (*meetings, publications, support*)

	Budget FY14	Actual FY14 (9/14/14)	Overspent/ (Underspent)
Annual Meeting[2]			
Juneau 2014	60,615.00	62,196.40	1,581.40
Student Travel	5,300.00	6,160.00	860.00
Travel Awards	2,000.00	1,998.00	(2.00)
Dues and Subscriptions:	2,000.00		
IUCN		490.76	490.76
Ornithological council		2,000.00	2,000.00
Publications:			
Marine Ornithology (layout, printing, mailings)	10,000.00	103.98	(9,896.02)
Pacific Seabirds (layout, printing, mailings)	6,000.00	2,089.05	(3,910.95)
World Seabird Union:			
Databases	8,000.00	7,998.00	(2.00)
World Seabird Conference 2 Donation	23,000.00	23,000.00	-
C. TOTAL SOCIETY SERVICES EXPENSES:	**$116,915.00**	**$106,036.19**	**$(10,878.81)**

D. PSG BUDGET SUMMARY

	Budget FY14	Actual FY14 (9/14/14)
TOTAL INCOME (A)	**$115,208.00**	**$101,020.76**
TOTAL EXPENSES (B + C)	**$125,315.00**	**$115,358.48**
CONCLUSION: SURPLUS/(LOSS)	**$(10,107.00)**	**$(14,337.72)**

[1]Membership income reported for FY14 is below what it should be owing to a glitch in the membership renewal software. This problem also affects the deficit reflected in this year's budget. An updated figure will be reported in a later issue.
[2]Approved annual meeting budget is available Local Committee Chair.
[3](A) Monthly online fee is $19.95. (B) If our combined accounts fall below $50k, we are charged a monthly service fee of $25. (C) Bank charge could also include wire transfer fees, credit card administrative fees, etc.
[4]Paid every two years; next payment is in 2016.
[5]Paid for the next 5 years; next payment is 2019.
[6]Monthly billing fee is $30 plus 3% of every transaction. Therefore PSG nets $38.54 not the $40 membership fee.
[7]$3.65 fee per registrant (so fee varies with usage).
[8]This is the amount for PSG's operating expenses.

REPORTS OF PSG'S COMMITTEES FOR 2013-2014

PSG's committees support research, work on conservation, keep us in touch, and support members throughout the Pacific. Their reports contain information on field work, current issues, and committee participation. Contact information for committee coordinators (i.e., chairs) can be found near the back of this issue.

JAPANESE AND KOREAN SEABIRD CONSERVATION COMMITTEE

Kim Nelson and Kuniko Otsuki, Coordinators

Committee members voted to change the name of the Japanese Seabird Conservation Committee (JSCC) to the Japanese and Korean Seabird Conservation Committee (JKSCC) at our meeting in Juneau, Alaska in February 2014. Our mandate stays the same: "to summarize and follow progress of seabird conservation issues in Japan and Korea, encourage international collaboration between scientists on certain projects, and provide information to Pacific Seabird Group (PSG) and other parties." The JKSCC will also serve as a repository of technical advice. Below, we summarize JKSCC activities in 2014 that have been provided by committee members.

MEETINGS

At the 2014 PSG meeting in Juneau we discussed recent research, bycatch issues, and rat and cat eradication efforts in Korea and Japan. We also announced updated information on the International Ornithological Congress (IOC) Roundtable that PSG, JKSCC, and the Japan Seabird Group (JSG) sponsored in Tokyo in August 2014.

SURVEYS & RESEARCH

Update on Hokkaido: See Asia and Oceania Regional Report in this volume.

Birojima, Kyushu: In April-July 2014, Yutaka Nakamura and Kuniko Otsuki (Marine Bird Restoration Group [MBRG]) conducted nest monitoring of Japanese Murrelets (*Synthliboramphus wumizusume*) to measure hatching success and predation at the largest known colony on Birojima. Four members of the Ministry of Kyushu joined monitoring on 16 May. In 2013, 40 nest crevices were tagged in plots under the forest canopy at the top of the island (n = 27), along the lower staircase (n = 6), and in shoreline caves (n = 7) (Whitworth et al. 2014). Only 51% (18 out of 35 nests checked) were used in 2014 and two new nests were found. Hatching success was much lower in 2014 (55%) than in 2013 (79%) and higher egg predation and similar adult predation occurred. Similar lower hatching success (55%) was found in 1993 when high predation also was recorded (Ono and Nakamura 1993; Ono et al. 1994, 1995). Jungle Crows (*Corvus macrorhynchos*) appeared to be responsible for most predation, although owls may have killed some adults. In 2011-2013, crow predation was thought to have been reduced to low levels but it now seems that predation varies highly among years. More work is needed to examine hatching success and predation to evaluate if Kadogawa fisherman education efforts are effective for reducing attraction of crows to leftover fishing bait at Birojima (Otsuki and Kubota 2012). Historically, extensive egg and adult harvesting were the greatest threat to murrelets at Birojima (Otsuki 2014) but in recent decades, crow predation has been the most serious problem.

As part of long-term monitoring for the Ministry of the Environment (MOE), Naoki Tomita (Yamashina Institute for Ornithology) conducted a single nest search on the island top on 17 April. A total of 37 nests with incubating adults or eggs was found in or near MBRG plots where we had previously found only 14 nests. Some murrelets may move nest locations to avoid predators or because they had new mates if one mate was killed. However, the MOE plot partially overlapped MBRG plots, making it difficult to identify the total number of nests on top of the island. In July, Nakamura set up 10 rat traps; no rats were detected but more work is needed.

Okinoshima and Koyahsima, Kyushu: See Asia and Oceania Regional Report in this volume.

Chilbal-do, Republic of Korea: Chang-uk Park (National Park Research Institute Migratory Birds Center) reported that the breeding status of Ancient Murrelets (*Synthliboramphus antiquus*) was examined at Chilbal-do Islet (in southwestern Korea and 50 km from the mainland) in March-May 2014. Chilbal-do is the largest known colony in Korea. Thirty-four active nests were observed, and timing of breeding has been confirmed from middle of February to end of April. Hatching success was 80% (n = 65 eggs). No suitable boat was available for spotlight surveys, so murrelets were counted from the islet, covering up to 1 km from shore and in all cardinal directions. Counts were conducted every 30 minutes from 2 hours before sunset until sunrise. The maximum count at 2 hours before sunset was about 500 murrelets, and just before sunrise was about 40,000 murrelets. This count was a minimum because more murrelets are likely gathering after sunset, they might congregate up to 3 km away from colonies (e.g., Sealy 1976), and not all murrelets are present in congregations at one time. Breeding population size had been estimated to be at least 3,000 pairs but appears to be much higher.

Japanese Murrelet and Rats (Okinoshima and Koyahsima): See the Asia and Oceania Report.

INTERNATIONAL SYMPOSIA AND WORKSHOPS

International Ornithological Congress (IOC), Japan (2014): Kim Nelson and Kuniko Otsuki attended the

IOC meeting in Tokyo, Japan, in August 2014. They held a Roundtable discussion (RTD) on "Restoring Seabird Breeding Colonies Invaded by Rats and Other Introduced Mammals in Japan and Korea" sponsored by PSG and JSG. The Roundtable included discussion of (1) the general patterns of island invasions to help prevent future invasions; (2) the most effective eradication techniques; and (3) baseline and post-eradication monitoring programs for seabirds. Presentations included: a keynote presentation on rat eradication in New Zealand by Dr. Keith Broome of the Island Eradication Advisory Group, New Zealand Department of Conservation; a talk on rat eradication in Japan by Dr. Takuma Hashimoto of the Japan Wildlife Research Center; talks on rat surveys on Okinoshima and Koyashima by Dr. Masayoshi Takeishi of the Kitakyushu Museum of Natural History and Human History and Mr. Gregg Howald of Island Conservation; a talk on rat issues in Korea by Dr. Young-soo Kwon of the Korea National Park Research Institute Migratory Birds Center; talks on the issue of cats on islands by Dr. Mark Rauzon of Laney College, Department of Geography and Dr. Nariko Oka of the Yamashina Institute for Ornithology; and talks on post-eradication monitoring by Mr. Darrell Whitworth of the California Institute of Environmental Studies and Mr. Paul Kelly previously of the California Department of Fish and Wildlife and American Trader Trustee Council. A report on next steps for addressing this issue in Japan and Korea is forthcoming.

Japanese Murrelet (Kaminoseki, Yamagushi Prefecture, Japan): In August 2014, the Kaminoseki Nature Conservation Association (KNCA; Midori Takashima) held three international symposia (in Yamaguchi, Kyoto, and Tokyo) entitled, "Biodiversity and the Rare Japanese Murrelet at Kaminoseki- Preserve," "'The Sea of Miracles' for the Children in the Future and Kaminoseki" and one RTD at the IOC entitled, "Biodiversity and the Rare Japanese Murrelet at Kaminoseki: 'The Sea of Miracles' and Kaminoseki nuclear power plant planning" (in Tokyo).

PSG members Kim Nelson and Darrell Whitworth were invited as speakers and Paul Kelly was invited as a commentator for those events. Shinichi Watanabe, who studies the Streaked Shearwater (*Calonectris leucomelas*) at Uwashima (the only known colony in the Seto Inland Sea) was also invited as a speaker. A total of roughly 630 people participated in those meetings (250 people at the Yamaguchi symposium, about 200 people at the Kyoto symposium, 150 people at the Tokyo symposium, and 30 people at the RTD). A positive sign with respect to KNCA events over the past 15 years was the participation of members of the Ministry of the Environment as a guest at the Tokyo symposium. One representative of the MOE spoke of his awareness of the importance of the Kaminoseki ecosystem during his opening remarks.

These symposia demonstrated the unique ecology of the Kaminoseki area compared to other regions in Japan and other areas along the Seto Inland Sea. For example, shearwaters can survive on smaller foraging areas because of the high availability of prey. In addition, Japanese Murrelets have been detected throughout the year within the Seto Inland Sea. Updated data logger information indicated wide movements of Japanese Murrelets after departing nest sites (Yamaguchi et al. 2014) with Japanese Murrelets in other areas likely moving to the North Pacific Ocean, but murrelets in the Kaminoseki area appear to use the Seto Inland Sea year-round which emphasizes its importance to this sensitive species. More intensive studies for searching for colonies and understanding murrelet ecology during the non-breeding season are planned for 2015.

LITERATURE CITED

Ono, K. and Y. Nakamura. 1993. The biology of the nesting Japanese Murrelets on Biroto Island (Kadogawa-cho, Miyazaki Prefecture). *In*: K. Ono (ed.). The Japanese Murrelet: its status and conservation. Proceedings of the 1993 meeting of the Japan Ornithological Society. Toho University, Chiba City, Chiba Prefecture, Japan.

Ono, K., J.N. Fries and Y. Nakamura. 1994b. Crow predation of Japanese Murrelets. Urban Birds 11: 63-68.

Ono, K., J. Fries, and Y. Nakamura. 1995. Crow predation on Japanese Murrelets on Biro Island, Japan. Pacific Seabirds 22: 39-40 (abstract).

Otsuki, K. 2013. Historical colony harvesting, at-sea hunting, and local fishing bycatch of the Japanese Murrelet at Birojima, Miyazaki-ken, Japan. Pacific Seabirds 40: 59-69.

Otsuki, K. and R. Kubota. 2012. Conservation and education efforts for Japanese Murrelets at Birojima and Kadogawa-cho, Miyazaki-ken, Japan. *In*: Y.S. Kwon, H.Y. Nam, C.Y. Choi and G.C. Bing (eds.). Status and conservation efforts on murrelets. Proceedings of the 6th International Symposium on Migratory Birds. National Park Migratory Bird Center, Shinan, Korea. pp. 71-88.

Sealy, S.G. 1976. Biology of nesting Ancient Murrelets. Condor 78: 294–306.

Whitworth, D., H. Carter, Y. Nakamura, K. Otsuki, and M. Takeishi. 2014. Hatching success, timing of breeding, and predation of Japanese Murrelets (*Synthliboramphus wumizusume*) at Birojima, Miyazaki-ken, Japan, in 2013. Unpubl. Report. Japan Seabird Group, Hokkaido University, Hakodate, Hokkaido, Japan. 51 p.

Yamaguchi, N., Nakamura, Y., Fukushima, H., Okuda, Y., Konaka, T., Nakamura, N., Okabe, H., Ogami, K., Yamamoto, T., and H. Higuchi. 2014. The path of the movement of the Japanese Murrelet revealed by GeoLocater. Japan Ornithological Society, 2014 annual meeting program, Rikkyo University, Tokyo. p.58. [abstract; in Japanese]

KITTLITZ'S MURRELET TECHNICAL COMMITTEE

John Piatt and Sarah Schoen, Coordinators

The Kittlitz's Murrelet Technical Committee (KMTC) was formed in 2008 to address concerns related to the status and conservation of this rare seabird. In 2004, the U.S. Fish and Wildlife Service (USFWS) included the Kittlitz's Murrelet (*Brachyramphus brevirostris;* KIMU) as a new candidate species for listing under the Endangered Species Act. The KIMU remained on the candidate list until 2013, when the USFWS announced a 12-month finding that listing the KIMU was not warranted at that time. The purpose of the KMTC is to: (1) act as a technical authority on the status, distribution, and life history of the KIMU; (2) identify, encourage, and facilitate research; (3) address conservation problems related to the KIMU; and (4) act as a liaison between research and management.

KMTC ACCOMPLISHMENTS, ISSUES, AND UPDATES

The KMTC last met on 19 February 2014 in conjunction with the Pacific Seabird Group meeting in Juneau, Alaska. Twenty-six members participated (six via telephone). Sarah Schoen facilitated the KTMC meeting and a summary is available upon request. John Piatt was absent.

Meeting highlights: Michelle Kissling discussed the process the USFWS went through in reaching their decision that listing was not warranted (2013), and the technical committee came to a consensus that the KIMU technical committee's role remained valuable and should continue following the USFWS decision. Three **action items** came out of our meeting: (a) write a letter to the USFWS and affiliated agencies underscoring our continued concern for the conservation of KIMU, the need for continued monitoring, and the importance of filling data gaps; (b) identify data gaps/recommendations for future KIMU work; and (c) identify threats or potential reasons for KIMU decline.

Matt Kirchhoff led the first action item, drafting a letter of concern to the USFWS, soliciting and incorporating edits from technical committee members, and passing the letter on to PSG's Vice-chair for Conservation, Stan Senner. Per Stan's suggestion, Arctic Terns (*Sterna paradisaea*, ARTE) were wrapped into an umbrella letter of concern (with KIMU), and Stan edited and improved the letter before forwarding it to the USFWS, with copies to the U.S. Forest Service, National Park Service, Alaska Department of Fish and Game, and the U.S. Geological Survey.

At the next KMTC meeting in San Jose, we will meet to: (1) identify KIMU research projects currently underway; (2) consider following up with the USFWS about our letter of concern for KIMU and ARTE, (3) identify leads for, and work on action items (b) and (c), above; (if these are not done before the meeting); and (4) consider what role the KMTC should play in the "post listing-decision environment" in the coming year.

SCRIPPS'S MURRELET AND GUADALUPE MURRELET TECHNICAL COMMITTEE

Harry Carter and Shaye Wolf, Coordinators

INTRODUCTION

In 2012, the American Ornithologists' Union split Xantus's Murrelet into Scripps's Murrelet (*Synthliboramphus scrippsi*) and Guadalupe Murrelet (*S. hypoleucus*), based on genetic separation (Birt et al. 2012). Both species will be considered for listing by the U.S. Fish and Wildlife Service (USFWS; see below). The mandate of the Scripps's Murrelet and Guadalupe Murrelet Technical Committee (SMGMTC; formerly the Xantus's Murrelet Technical Committee) is to "monitor the federal listing petition, state status, research, and conservation issues; provide information to interested parties; and coordinate research and conservation in the U.S., Mexico, and Canada." The Scripps's Murrelet occurs at sea along western Baja California, California, Oregon, Washington, and south-central British Columbia; it breeds on islands off southern California and northwestern Baja California. The Guadalupe Murrelet also occurs at sea in the same areas as Scripps's Murrelet; but it breeds mainly at Guadalupe Island, with smaller numbers at the San Benito Islands and at some other islands as far north as Santa Barbara Island. Below, we summarize SMGMTC activities in 2014.

MEETINGS

The SMGMTC did not meet at PSG's Annual Meeting in Juneau in February 2014. We will meet at the February 2015 PSG meeting in San Jose and expect to host a relatively large meeting there.

MANAGEMENT AND RESTORATION PLAN

The SMGMTC has actively participated in preparing the Murrelet Management and Restoration Plan that will guide state and federal efforts to protect and restore Scripps's and Guadalupe murrelets at breeding islands in southern California and northwestern Baja Cali-

fornia. This plan will be the first such effort for these species. Humboldt State University (HSU), funded by the California Department of Fish and Wildlife (CDFW), led plan preparation. Several SMGMTC members are primary authors and several organizations, universities, and agencies in the U.S. and Mexico are involved. SMGMTC has spearheaded this collaborative effort. The draft plan was completed in 2011 (Carter et al. 2011), and the final plan will be completed in 2015. The document will be published as a CDFW report in both English and Spanish, and will be posted on CDFW and PSG websites.

LISTING STATUS

In the USFWS Candidate Notice of Review published in November 2013, Xantus's Murrelet (as referred to in the original listing petition) retained a listing priority number of 5. USFWS will conduct a status review of both new species and, by 30 September 2016, submit to the Federal Register a proposed rule for listing as threatened or endangered or a finding that listing is not warranted. The SMGMTC is aiding the status review process by: (1) continuing to provide updated information to better assess current status, threats, and conservation of the Scripps's and Guadalupe murrelet in the U.S. and Mexico; (2) completing the Management and Restoration Plan described above; and (3) encouraging further publication of research on Scripps's and Guadalupe murrelets (see below).

The State of California officially listed the Xantus's Murrelet as Threatened in December 2004. However, there is still no recovery plan or implementation schedule. Xantus's Murrelets are listed as Endangered in Mexico; the species is not listed in Canada. These designations have not yet been changed since Xantus's Murrelet was officially split into Scripps's Murrelet and Guadalupe Murrelet.

WESTERN FOUNDATION OF VERTEBRATE ZOOLOGY PUBLICATION

In 2005, PSG and CWS hosted a symposium on Xantus's Murrelets at the Portland meeting. A symposium proceeding was prepared in *Marine Ornithology* (Volume 33, No. 2). However, several papers were not prepared in time for inclusion and additional studies have been conducted since 2005. At the SMGMTC meeting in February 2013 in Portland, Oregon, we discussed the preparation of another volume of papers on Scripps's and Guadalupe murrelets for publication in the *Proceedings of the Western Foundation of Vertebrate Zoology*. Several manuscripts are expected to be prepared and submitted for review in 2015-2016. Papers in this volume would greatly assist listing, management, and conservation decisions in the near future.

NEST MONITORING

In 2014, nest monitoring of Scripps's Murrelets to measure hatching success, timing of breeding, and changes in population size was conducted at four locations in California: (1) Santa Barbara Island, by the California Institute of Environmental Studies (CIES) and Channel Islands National Park (CINP: Mazurkiewicz), with funding from the *Montrose* Settlements Trustee Council (MSTC); (2) Anacapa Island, by CIES (Whitworth), with funding from the *American Trader* Trustee Council; (3) San Clemente Island, by CIES (Whitworth and Carter) with funding from the U.S. Navy (USN); and (4) Santa Catalina Island, by CIES (Whitworth) and the Catalina Island Conservancy (CIC; Dvorak), with CIC funding. Harvey et al. (2012, 2013a, 2014) reported findings from 2008-2012 nest monitoring at Santa Barbara Island. Guadalupe Murrelets are regularly present and also may nest at San Clemente Island but no nests have been found to date. Whitworth et al. (2013a) reported findings from 2000-2010 nest monitoring at Anacapa Island. Harvey et al. (2013b) reported findings from 2011-2012 nest monitoring at Anacapa Island. Whitworth et al. (2013b, 2014) reported findings from 2012-2013 nest monitoring at San Clemente Island. Whitworth et al. (in press) reported findings from 2012-2013 nest monitoring at Santa Catalina Island.

Nest monitoring has not been conducted in Baja California since 2007 due to: (1) completion of CIES monitoring funded by Chevron at the Coronado Islands in 2007 (related to the withdrawn liquefied natural gas [LNG] terminal plan); and (2) insufficient funds by Mexican groups and researchers at San Benito Islands. A long-term monitoring program is needed in northwestern Baja California.

SPOTLIGHT SURVEYS AND AT-SEA CAPTURES

Spotlight surveys are increasingly being used for colony detection and for estimating and monitoring population size at *Synthliboramphus* murrelet breeding colonies (Whitworth and Carter 2012, in press; Whitworth et al., in press). At-sea captures have been used to assess breeding status and to band birds. In 2014, spotlight surveys and at-sea captures of Scripps's and Guadalupe Murrelets were conducted at: (1) Anacapa (CIES: Whitworth and Carter) with funding from the National Fish and Wildlife Foundation; (2) San Clemente Island (CIES: Whitworth and Carter) with funding from the USN (see Whitworth et al. 2014 for 2013 surveys); and (3) Santa Catalina Island (CIES and CIC: Whitworth and Dvorak) with funding from CIC (see Whitworth et al. [in press] for 2012-2013 surveys). Harvey et al. (2014) reported findings from 2011-2012 spotlights surveys and at-sea captures at Santa Barbara Island.

RESTORATION

Anacapa Island: Black rat (*Rattus rattus*) eradication was conducted in 2001-02 (Island Conservation and CINP), funded by the *American Trader* Trustee Council (Howald et al. 2005). Annual nest monitoring by HSU and CIES from 2000-10 showed that numbers of nests found in monitored areas grew substantially and high hatching success occurred. However, most upper island areas have not yet been reused for nesting (Whitworth et al. 2013a; Harvey et al. 2013b).

Santa Barbara Island: Native plant restoration by CIES/CINP began in 2007 (funded by MSTC). This work has since expanded greatly, and will continue for

many years,. Annual nest monitoring occurred in 2007-2012 (Harvey and Barnes 2009, Harvey et al. 2012, 2013a, 2014).

CONSERVATION ISSUES

Introduced Mammals: At most islands where Scripps's and Guadalupe murrelets breed, introduced mammals have been eradicated over the past 30 years. Efforts continue to control cats at the south end of Guadalupe Island and at San Clemente Island. Several proposals to fund cat eradication at Guadalupe Island have been prepared but not yet funded. In 2014, the Institute for Wildlife Studies (Garcelon et al.), with funding from the USN, conducted local control (trapping) for Black Rats around murrelet nesting areas at San Clemente Island. In November and December 2013, Grupo de Ecología y Conservación de Islas (GECI) conducted an eradication effort on West San Benito Island for the Cedros Cactus Mouse (*Peromyscus eremicus cedrosensis*), which was accidentally introduced in 2007. GECI also is working with the local fishing community to enforce measures to prevent re-introduction of non-native species. No efforts to control or remove introduced rats or cats are underway at Cedros Island or Santa Catalina Island, although most murrelets likely breed in areas that are not currently accessible to introduced mammals.

Artificial Lights at Night: Few efforts have addressed potential impacts from bright lights near breeding colonies (i.e., squid fishing lights, aquaculture facilities, anchored vessels, etc.). In 2014, the Bureau of Ocean Energy Management (BOEM) released a Hamer Environmental report on audio-visual and radar surveys for Scripps's Murrelets in spring, summer, and fall of 2013 at Platform Hermosa (near Point Conception) and Platform Grace (west of Ventura). The goals of this BOEM-funded study were to: (1) evaluate the extent to which Scripps's Murrelets interact with bright lights of offshore oil platforms off the coast of southern California; and (2) determine if important rafting and foraging areas exist near offshore platforms (BOEM 2014). The study found that "light attraction events as measured by radar were low over the three seasons on the majority of the 56 nights where successful sampling occurred. However, 40 of the 60 nights (66.7%) of the study were spent on Platform Grace, which had very low light emittance levels and thus may have affected study results. In addition, Peregrine Falcons (*Falco peregrinus*) were found to use the oil platforms to hunt from and appeared to be killing significant numbers of Scripps's Murrelets in the spring" (BOEM 2014). Seabird restoration plans for seven islands off the Pacific coast of Baja California funded by MSTC and *Luckenbach* Trustee Council also identified the reduction of artificial light pollution as a restoration priority.

LNG Proposals: The SMGMTC has been following proposals for the construction of LNG terminals near Scripps's Murrelet colonies in CINP. Most of these projects have been terminated with the exception of Esperanza Energy's Port Esperanza located approximately 15 miles seaward of the Port of Long Beach; it is currently on hold.

Offshore Alternative Energy Developments: A large suite of renewable offshore ocean energy projects are being considered for the West Coast, including offshore wind energy, wave energy, ocean current energy, offshore solar energy, and hydrogen generation, all of which have the potential to negatively impact the Scripps's Murrelet and other seabirds. The SMGMTC has been monitoring opportunities to provide public comments on offshore renewable energy project proposals. In 2007, BOEM issued its "*Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf.*" In 2014, the U.S. Department of Energy awarded a $47 million grant to the Wind Float Pacific Project, which is 30-megawatt offshore wind pilot demonstration project 15 miles off Coos Bay, Oregon. BOEM will be conducting an Environmental Assessment of the project; the SMGMTC plans to submit comments.

LITERATURE CITED

Birt, T.P., H.R. Carter, D.L. Whitworth, A. MacDonald, S.H. Newman, F. Gress, E. Palacios, J.S. Koepke, and V.L. Friesen. 2012. Rangewide population genetic structure of the Xantus's Murrelet (*Synthliboramphus hypoleucus*). Auk 129:44-55.

Bureau of Ocean Energy Management (BOEM). 2014. BOEM 2014-013 Technical Summary. Using nocturnal surveys to monitor the presence of Ashy Storm-Petrels & Xantus's Murrelets at offshore platforms, Southern California. http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5408.pdf

Carter, H.R., D.L. Whitworth, S. Wolf, T. Birt, A.L. Harvey, M. Félix Arránga, R.T. Golightly, F. Gress and E.B. Burkett. 2011. Management and restoration plan for *Synthliboramphus* murrelets at breeding areas in California and northwestern Baja California. Unpubl. report, Humboldt State University, Arcata, California.

Harvey, A.L., C.E. Hand, and S.A. Auer. 2012. Scripps's Murrelet reproductive performance on Santa Barbara Island, California in 2008-2009. Unpubl. report, California Institute of Environmental Studies, Davis, California. 20 p.

Harvey, A.L., S.A. Auer, K.W. Barnes, D.M. Mazurkiewicz, C.A. Carter, M.E. Jacques, and A.A. Yamagiwa. 2013a. Scripps's Murrelet, Cassin's Auklet, and Ashy Storm-Petrel colony monitoring and restoration activities on Santa Barbara Island, California in 2010-2011. Unpubl. report, California Institute of Environmental Studies, Davis, California. 81 p.

Harvey, A.L., D.M. Mazurkiewicz, M. McKown, K.W. Barnes, M.W. Parker, and S.J. Kim. 2013b. Ashy Storm-Petrel, Scripps's Murrelet, and Cassin's Auklet reproductive status assessments and restoration recommendations in 2011-2012. *In*: Reproductive status assessments and restoration recommendations for Ashy Storm-Petrels, Scripps's Murrelets, and Cassin's Auklets breeding on Anacapa Island, Channel Islands National Park. Unpublished report, California Institute of Environmental Studies, Davis, California; and Conservation Metrics, Santa Cruz, California. pp. 3-55.

Harvey, A.L., J.A. Howard, D.M. Mazurkiewicz, M.E. Jacques, S.A. Auer, C.A. Carter, K.W. Barnes, A.A. Yamagiwa and S.J. Kim. 2014. Scripps's Murrelet, Cassin's Auklet, and Ashy Storm-Petrel reproductive monitoring and restoration activities on Santa Barbara Island, California in 2012. Unpubl. report, California Institute of Environmental Studies, Davis, California. 38 p.

Howald, G.R., K.R. Faulkner, B. Tershy, B. Keitt, H. Gellerman, E.M. Creel, M. Grinnell, S.T. Ortega and D.A. Croll. 2005. Eradication of Black Rats from Anacapa Island: biological and social considerations. *In*: D.K. Garcelon and C.A. Schwemm (eds.). Proceedings of the sixth California Islands symposium. National Park Service Technical Publication CHIS-05-01, Institute for Wildlife Studies, Arcata, California. pp. 299-312.

Whitworth D.L. and H.R. Carter. 2012. Spotlight surveys for assessing *Synthliboramphus* murrelets attending nocturnal at-sea congregations. In: Y.S. Kwon, H.Y. Nam, C.Y. Choi and G.C. Bing (eds.). Status and conservation efforts on murrelets. Proceedings of the 6th International Symposium on Migratory Birds. National Park Migratory Bird Center, Shinan, Korea. pp. 119-138.

Whitworth, D.L., and H.R. Carter. In press. Nocturnal spotlight surveys for surveying and monitoring Scripps's murrelets in at-sea congregations at Anacapa Island, California, 2001-2006. Monographs of the Western North American Naturalist 7.

Whitworth, D.L., H.R. Carter, and F. Gress. 2013a. Recovery of a threatened seabird after eradication of an introduced predator: eight years of progress for the Scripps's Murrelet at Anacapa Island, California. Biological Conservation 162: 52-59.

Whitworth, D.L., H.R. Carter and F. Gress. 2013b. Status of Scripps's Murrelet and Guadalupe Murrelet at San Clemente Island, California, April-May 2012. Unpubl. report, California Institute of Environmental Studies, Davis, California. 50 p.

Whitworth, D.L., H.R. Carter and F. Gress. 2014. Status of Scripps's Murrelet, Guadalupe Murrelet and Ashy Storm-Petrel at San Clemente Island, California in 2013. Unpubl. report, California Institute of Environmental Studies, Davis, California. 52 p.

Whitworth, D.L., H.R. Carter, T.M. Dvorak, L.S. Farley, and J.L. King. In press. Status, distribution, and conservation of Scripps's Murrelet at Santa Catalina Island, California. Monographs of the Western North American Naturalist 7.

MARBLED MURRELET TECHNICAL COMMITTEE

Peter Harrison and Kim Nelson, Coordinators

The Marbled Murrelet Technical Committee (MMTC) has been a long-standing committee of the Pacific Seabird Group. Its roles are to: (1) act as a technical authority about the status, distribution, and life history of the Marbled Murrelet (*Brachyramphus marmoratus*); (2) encourage, facilitate, and identify research needs; (3) address conservation problems related to the Marbled Murrelet; and (4) act as a liaison between research and management.

MMTC ACTIVITIES AND ACCOMPLISHMENTS IN 2013-2014

(1) The MMTC met at the Annual Pacific Seabird Group Meeting in Juneau, Alaska, on 19 February 2014.

(2) The MMTC Inland Survey Protocol Subcommittee (ISP) is continuing work on revisions to the 2003 survey protocol. Peter Harrison, Washington Department of Natural Resources, is coordinator of this subcommittee. To meet the requests of many MMTC members and various users of the survey protocol, a well-represented group of stakeholders is participating in the process. A thorough review of the existing protocol is underway to identify subjects needing revision. The ISP Subcommittee will be very active over the next year. A revised protocol is expected in fall 2015 for implementation in the 2016 survey season.

(3) The U.S. Fish and Wildlife Service provided funding to Kim Nelson at Oregon State University to coordinate the reanalysis of the probability of occurrence for the survey protocol. Darryl MacKenzie with Proteus Wildlife Research Consultants in New Zealand will conduct the analysis.

(4) We reinstated the MMTC Marine Subcommittee, which has been inactive for many years. Amilee Wilson, National Oceanic and Atmospheric Administration (Fisheries), and Matt Reed, Hamer Environmental, agreed to be Coordinators. The subcommittee identified a set of issues to address murrelet conservation in the marine environment including (in order of priority): (a) MAMU bycatch in fisheries; (b) identification of important marine areas; (c) prey resources including changes in prey distribution/spawning and removal of prey species; (d) oil mortality including risks and effects of shipping traffic and MAMU response handling protocol; (e) chemical contaminants; (f) marine wave/wind farms; (g) marine aquaculture; and (h) underwater construction and sound pollution. The subcommittee will divide into separate work groups to address these priorities.

IMPORTANT UPDATES

(1) Expect a revised Marbled Murrelet Inland Survey Protocol in the fall of 2015 for implementation in the 2016 survey season.

(2) See the Regional Reports for Washington and Oregon to find the latest information on Marbled Murrelet populations and trends in the Pacific Northwest.

SEABIRD MONITORING COMMITTEE

Heather Renner and Robb Kaler, Coordinators

Seabird monitoring is the accumulation of time-series data on any aspect of seabird distribution, abundance, demography, or behavior. The Pacific Seabird Group (PSG) Seabird Monitoring Committee was formed in 1992 and has four main themes: (1) coordinate sharing of monitoring results in a timely manner; (2) evaluate current-year results to help inform other PSG committees; (3) develop standardized protocols and data management practices; and (4) promote the effective use of seabirds as indicators of local and large-scale change in the Pacific marine environment. The Seabird Monitoring Committee, led by Dr. Scott Hatch (Institute for Seabird Research and Conservation) since its inception in 1992, has largely focused on the herculean task of developing the Pacific Seabird Monitoring Database (PSMD) for archiving and sharing seabird monitoring results from throughout the North Pacific. After serving as the Committee Coordinator for 22 years and spearheading the development and construction of the PSMD, Dr. Hatch retired from the U.S. Geological Survey and passed the baton to two new coordinators at the 2014 PSG meeting in Juneau: Heather Renner (USFWS – Alaska Maritime National Wildlife Refuge) and Robb Kaler (USFWS – Division of Migratory Bird Management).

Since the PSMD is now established, Heather and Robb felt it was important to re-visit the original goal of the committee, i.e., to establish better communication among people engaged in seabird monitoring throughout the Pacific region. This goal requires a coordinated effort over a wide geographic area and can only be attainable through good communication and partnerships. Returning to this founding principle, we are most concerned with improving contacts and cooperation within the community of Pacific seabird researchers and wildlife managers.

To that end (or renewed beginning), in 2014 the Seabird Monitoring Committee aimed to redefine its purpose and chose to focus less on database development and more on networking and addressing "real time" concerns for the state of Pacific seabirds. For the 2015 Seabird Monitoring Committee meeting, we ask that regional representatives, or their designees, provide a brief report to the committee that highlights headlines from the 2014 field season and identifies any immediate concerns for Pacific seabirds. Additionally, we ask committee members to help identify hurdles to overcome and provide input on how we can be more effective at sharing information and directing our conservation efforts. Are research results available in a timely enough manner to be useful for their intended purpose? Are methods consistent enough for broader synthesis? Do we have the data needed to answer key questions? Our ultimate objective is to rebrand the Seabird Monitoring Committee as a tool to inform the other PSG committees (Executive Committee, Conservation Committee, Technical Committees, etc.).

As we move forward, we thank Scott Hatch for his vision and dedication to the Seabird Monitoring Committee and the PSMD. Scott is a stalwart supporter for coordination, dissemination, and promotion of seabird monitoring results, and has been a pioneer in fostering broad approaches using seabirds as large-scale indicators of change in the Pacific marine environment. We are grateful and look forward to Scott's continued involvement in the Seabird Monitoring Committee.

CORRESPONDING MEMBERSHIP COMMITTEE

Melaine Steinkamp, John Piatt, and Jessica Hardesty, Coordinators

The Corresponding Membership Committee provides PSG membership to researchers and conservationists in developing countries. Committee members presently include Melanie Steinkamp, John Piatt, and Jessica Hardesty. To retain "Corresponding Membership," recipients are asked to provide a brief report on research or conservation in their area for *Pacific Seabirds* at least every three years. Corresponding members facilitate other communications, such as the Indian Ocean Seabird Group Newsletter that has been periodically posted to the PSG Listserv. There are a total of 16 Corresponding Memberships allotted by the PSG. We can make those names available upon request.

We presently have eight Corresponding Members representing Chile, China, Colombia (2), Fiji, Ecuador, The Indian Ocean, and Peru. The goals of the Committee in 2014 are to gain two new members and to encourage reports from all current members. The Committee will also be surveying existing members to determine how to best meet the needs of Corresponding Members and PSG. Please contact Melanie Steinkamp if you have suggestions for other members. Contact: Melanie Steinkamp: Melanie_Steinkamp@fws.gov

ELECTIONS COMMITTEE

Alan E. Burger, Coordinator

GENERAL

Pat Baird stepped down after many years of serving as coordinator of the Elections Committee. Many thanks Pat! She continues as a member of this committee in her role as PSG Secretary. I took over as coordinator in mid-2013. All of the members in her committee also stepped down, and re-building the committee has been my priority in 2014. Ken Morgan has agreed to serve (and helped a lot with the 2014 election) and several other PSG members have been approached to join the committee.

2014 ELECTION

Perhaps due to my inexperience as coordinator and rusty powers of persuasion, it proved very difficult to find candidates to run for Chair-elect in 2014. No fewer than 21 prominent and experienced PSG members were approached and all declined except for Kathy Kuletz, who is now chair-elect. It is disheartening that people who regularly attend PSG meetings for many years are sometimes not prepared to serve on EXCO.

Fortunately, candidates were more forthcoming for regional representative and student representative posts, and we had two candidates for each region and three for the student position. The willingness of student members to serve on PSG EXCO is encouraging.

Ballots were sent out on 7 January 2014 by email to 475 members and by regular post to 12 members. Three emails bounced back. A separate note was posted on the PSG listserv reminding members to vote and to contact me if they had not received a ballot. One member responded and was sent a ballot to a new e-mail address. A dedicated gmail address was set up to receive returned ballots (psgelections@gmail.com). This system seemed to work well, except that the returned ballots had to be opened separately to read the ticked votes. A more streamlined voting system (perhaps with Survey Monkey) will be investigated.

The following is the final tally for the 2014 election:

POSITION	CANDIDATES (*elected in bold)
Chair-elect	**Kathy Kuletz***
Treasurer	**Christin Ogura***
Student Representative	**Abraham Borker***
	Jennifer Ma
	Andrew Titmus*
Europe/Africa	**Stefan Garthe***
	Steffen Opel
Asia/Oceania	Rachel Buxton
	Kuniko Otsuki*
Alaska/Russia	**Robb Kaler***
	Martin Renner
Northern California	Allison Fuller
	Anna Weinstein*

At the end of the 30-day vote period (7 February 2014), a total of 114 ballots had been returned (23% of the 497 ballots sent out), no write-in votes were received. A surprising number of members tried to vote for candidates outside the region in which they lived and each ballot was cross-checked with the member's region to leave out ineligible votes. The spreadsheet used to tally the votes and check off members' ballots received is available for inspection.

The vote for the student representative was a dead heat between Abraham Borker and Andrew Titmus while Jennifer Ma received fewer votes. Consequently I did a complete re-count, re-examining all the ballots sent in by eligible student members. One student member did not vote for any student candidate. Because there was a tie for Student Representative, the bylaws call for a vote by the EXCO to break the tie. Therefore, at the EXCO meeting in Juneau, Andrew Titumus was voted in as the new Student Representative.

PSG LISTSERV

Verena Gill

The listser needs to be moved from the U.S. Fish and Wildlife Service's server to a private one. In terms of cost, buying a perpetual license will cost more up front but will be cheaper in the long run. Verena recommends buying the required software rather than leasing it.

OTHER REPORTS TO THE EXECUTIVE COUNCIL IN 2014

These reports are from the editors of our two journals, and from organizations of which PSG is a member.

PACIFIC SEABIRDS

Vivian Mendenhall, Editor (ret. February 2014)

ISSUES OF PACIFIC SEABIRDS FOR 2013:

- Spring 2013, Volume 40, number 1 (published June 2013). Two-hundred and fifty copies were printed, for $2,149.24; 188 copies were mailed – 131 to US addresses for $277.72, and 57 to non-US addresses for $305.25.
- Fall 2013, Volume 40, number 2 is still in progress. Anticipated publication date is late March 2014.

Note from Interim Editor: Volume 40, number 2 was published in August 2014. One hundred and ninety copies were printed and mailed for $2,089.05; 141 copies were mailed to US addresses and 49 to non-U.S. addresses.)

MY RESIGNATION

As I announced at the EXCO meeting last November (and to the Chair in July), I am resigning as Editor, effective at midnight on 22 February 2014. My service as Editor has been extremely rewarding, and I will miss many aspects of the job—not least being a member of EXCO.

ASSISTANT EDITORS

I've had valuable and (almost) regular editorial assistance from a compiler of the Conservation Report and a number of Regional Representatives, and for a year and a half recently, from Pat Baird. No one stepped up to help with the Fall 2013 issue (although normally a Regional Representative assists by editing that section). Therefore I advertised the opportunity on the Listserv. To my surprise and delight, seven individuals volunteered; some even supplied a full CV. I selected three people to help: Sarah Allen and Laura Macfarlane-Tranquilla for editorial review of articles, and Leslie Slater to edit the Regional Reports. I have kept a file of the other names, and all may be willing to assist again in the future.

THE FUTURE OF *PACIFIC SEABIRDS*

Pacific Seabirds has contributed for 40 years to the respect that PSG enjoys among the community of seabird researchers and conservationists. I personally hope that it will continue to do so. EXCO wishes to consider several options for the future of *Pacific Seabirds*. The decision is up to the next EXCO, of course. However, I'd like to comment on a few options.

- **Status quo**: Over half our members are receiving the journal electronically (only); this is the "default option." The remaining members have specified that they wish to receive a "hard copy" in the mail, and they currently pay US$10 for the privilege (except for Life Members). We also send hard copies to about a dozen libraries, for which we charge US$30 annually. This may have changed and should be investigated.
- **Electronic-only publication**: The journal presumably would remain similar to the present version, except that no printed copies would be mailed. The same editing and layout would be required. PSG would save the costs of printing and mailing; EXCO can determine whether this would be a significant portion of our budget.
- **Blog-style or newsletter formats on the Web:** These ideas have been suggested as a less labor-intensive means of sharing news and ideas. I can see the attraction of this version. However, it would no longer be a professional-level publication. As a periodical, *Pacific Seabirds* attracts occasional manuscripts for short peer-reviewed articles on seabird conservation in the Pacific. The journal fills a useful niche, because larger journals may not be interested in this type of writing. Peer-reviewed articles (even short ones) require rigorous editing, as well as arranging for reviewers and extensive correspondence with authors. A blog or newsletter does not provide this type of forum.

Onward with a new editor: When EXCO decides on the future format of *Pacific Seabirds* (at least provisionally), the search can begin for a new editor. I will be glad to help with this (as a member of a search committee, not its chair). I will also be available to answer questions and provide suggestions. I'll also post my layout template (an InDesign copy of the journal) and other format information on the EXCO site.

MARINE ORNITHOLOGY

Tony Gaston, Managing Editor; David Ainley, Editor-in-Chief

SUMMARY

- Marine Ornithology (MO) appeared as two regular issues in 2013, along with one "Special Issue."
- We began to publish papers "online early," although this system has not kept up with the backlog to date.
- Averaged over recent years, MO currently requires about US$3,000 annual support from PSG.
- Subscriptions are declining and may be approaching the point where a print edition is no longer useful.
- As support relies more and more on page charges, we need to upgrade the journal to attract the sort of authors who will pay.
- The hiring of a Business Manager is proposed, with a view to increasing the volume of sponsorship (currently only one firm).
- A more active involvement by PSG in charting the future direction to be taken is solicited.

ORGANIZATION

David Ainley began his tenure as Editor-in-Chief on 1 January 2013 and has dealt with all papers arriving at the editorial office after that. Forty-two papers were received by the journal in 2013. Tony Gaston continued to deal with papers left over from earlier years and most of these were either accepted or rejected in 2013, although a few might re-appear at some point. Thirty-four papers, comprising 204 pages, were published in the two regular issues in 2013, while a Special Issue (42 pages), devoted to the Black-capped Petrel (*Pterodroma hasitata*), was also published (in April). The authorship included first authors from 11 countries on 5 continents. Eco-regional breakdown was as follows: polar 2, subpolar 9, temperate 8, subtropical 6, tropical 9. Species groups: multi-group 6, penguins 3, auks 7, cormorants 4, petrels 6, gull 2, terns 2, frigatebirds, boobies, tropicbirds, and pelicans 1 each.

Twenty-eight papers were accepted in 2013, of which 20 were published this year, the rest will appear in the first issue for 2014. All other papers published in 2013 were left over from 2012. As of June 2013, we began to publish papers "online early" as soon as the proofs were accepted. For a variety of reasons, not all of which could have been avoided, we were unable to keep up doing this in a timely fashion and some papers have waited as long as four months from acceptance before appearing online. However, in the future it should be possible to deal with them faster than this, and we hope to be caught up by the end of March, when we shall begin to compile Issue 1 for 2014.

Last year, I (Tony) proposed that I would continue as Managing Editor for the immediate future. Unfortunately, an abrupt deterioration in my wife's health soon after I wrote last year's report has left me with less spare time than I expected and I now feel that I should step aside from some of my duties over the next year. Instead, I suggest finding/appointing an additional staff member, possibly termed "Business Manager." That individual would handle the finances, dealing with subscriptions and page charges, and raising additional funding through sponsorship and advertising. They could also work on several projects that have not been pursued because of lack of time over the past few years, such as getting inclusion in the Thompson/ISI web of science, and getting papers posted to the SORA web site. I propose that I should continue to deal with papers post-acceptance, working with the Technical Editor, Carolyn Brown, and the layout team, Reber Creative, and would continue to be the point of contact for our webmaster, Ben Saenz. The contact e-mail address for the journal has been changed to: editor@marineornithology.org

The job of Business Manager will, I think, require some financial inducement. However, I think it possible that a keen person could raise sufficient sponsorships and retrieve sufficient page charges to allow for an honorarium of several thousand dollars to be recovered. It does require a special person, though: someone who appreciates the purposes of the PSG and Marine Ornithology.

SUBSCRIPTIONS

The number of subscribers to the print edition continues a slow decline. As of 2013 we had 35 institutional subscribers and 22 individuals, as well as 23 complimentary copies sent to deposit libraries, abstracting services, contributing societies, and various particularly helpful individuals. Subscriptions contributed $4,490 to income, less than one third. The subscription for Institutions was raised from $90 to $100 for 2013, but we lost four subscriptions, so the increase was revenue-neutral. In my opinion, the print edition is now redundant. Electronic media have become so ubiquitous that maintaining a print edition no longer has any value, provided that we are satisfied that our web material is safe in perpetuity. At the same time, our electronic edition, appearing only as .pdf files, is definitely not taking advantage of current state of the art in electronic journals. We need to explore ways to upgrade it—that should probably be pursued by some young, tech-savvy individuals.

FINANCES

The table below shows income and expenditure for the past nine years. The numbers for 2013 represent only money in and out—the invoice for editing and layout of the last issue is still pending. The costs for the Special Issue were entirely covered by the authors. In addition, Dan Anderson, who contributed a major paper on Brown Pelican to Issue 2, made a generous overpayment on page charges. PSG contributed US$6,000.00, UK Seabird Group CN$1,513.60, Dutch Seabird Group CN$1,027.40 and Australasian Seabird Group CN$418.90. The other groups pay on a per-member basis: 1 Euro from the Dutch, 1 sterling from the UK group and USDS from the Australians. All these groups are fully sub-

scribed up to 2013. A cheque for $500 from LOTEK Instruments for 2013 is expected soon. This level of support is encouraging, but I am sure more sponsorships could be availed of if we had someone working on it.

My statement in last year's report, that the size of requests to PSG may increase over the next few years if we receive increasing numbers of publishable papers, remains true. If we go to three issues annually, publishing 250 pages/year, we would probably require an additional $2-3,000. If we drop the print edition, of course, moving to three, or even four issues annually becomes simple. However, editing and layout costs are still on a per-word or per-time basis, and therefore escalate in proportion to the number of words. Currently, with a few exceptions, only North American authors pay page charges—mainly those authors with University or Government Agency positions. Expanding the journal will only be viable if we continue to get plenty of contributions from those willing to pay. That likelihood should improve if we improve our journal, so expanding and upgrading need to go hand in hand.

I would really appreciate it if members of the EXCO would take some time to look at recent issues on the web and provide me with any feedback you have on style, format, content, etc. Your thoughts on the issue of funding would be welcome. Should we be dropping the print edition? Should we raise page charges, or look for sponsorships to plug the revenue gap? Are we willing to risk hiring a Business Manager?

Also, as last year, I invite everyone to provide us with Forum pieces, which seem to have petered out recently.

TABLE 1. Income and expenditures for Marine Ornithology, 2005-2013, including financial support by PSG.

Balance on 1 Jan 2005	$7,731.26			
Volume Year	Income	Expenses	PSG financial contribution	PSG contribution of papers
2005	$9,042.53	$12,867.35	$4,200.00	PSG symposium
2006	$16,979.87	$9,663.29	$4,065.00	
2007	$6,157.59	$15,304.08		
2008	$17,296.25	$11,990.19	$6,000.00	
2009	$10,569.07	$13,103.64		PSG symposium
2010	$7,256.40	$8,564.51		
2011	$14,223.15	$9,823.53		PSG symposium
2012	$15,426.22	$20,618.33	$7,850.00	
2013	$16,827.00	$12,925.00	$6,365.00	
Totals	$121,509.34	$114,859.92	$28,470.00	
Current Balance	$6,706.42			
Mean PSG annual contribution			$3,164.33	
Mean annual cost			$12,762.11	
PSG's contribution as % of total income			25%	

TABLE 2. An approximate budget for the journal (two issues) as of 2013 is given below, projecting a shortfall of about $2,700 to be covered by PSG – that is close to the mean annual contribution since 2005 ($3,164, see above table).

Expenditures		Income	
Layout and printing (150,000 words)	$7,300	Subscriptions	$4,490
Editing (CN$16 per 1000 words)	$2,400	Sponsorship	$500
Bank charges	$264	Page charges ($30/page, $100 colour, 50% recovery)	~$3,700
Postage	$2,000	Seabird group contributions	~$600
Totals	$11,964		~ $9,290

WORLD SEABIRD UNION

Robb Kaler and David Irons

Global Seabird Colony Register Development and Seed Money for the Next World Seabird Conference

SUMMARY

The purpose of this report is to provide information to complete the transactions between PSG and the World Seabird Untion (WSU) involving money that remained after the first World Seabird Conference (WSC). There is still money for databases and for seed money for WSC II.

- WSU has completed the work on the Global Seabird Colony Register as proposed in the fall of 2012. The original proposal was for $17,000. PSG has transferred $9,000. We respectfully request the other $8,000 be transferred at this time.
- We ask PSG to pay $23,000 to the Cape Town International Convention Centre for a down payment on the venue for the 2nd World Seabird Conference, as agreed in June 2013.

GLOBAL SEABIRD COLONY REGISTER PROPOSAL INFORMATION

Aim: To develop an interconnected, interoperable network of databases of seabird breeding sites worldwide.

Function: To serve as a basic resource for seabird research and conservation initiatives at local, regional, and global scales, particularly in terms of assessing vulnerabilities of breeding sites to threats (coastal development, energy generation, mineral extraction, oil pollution, invasive alien species, climate change, etc.). An additional function is to help build capacity especially in developing and transitional countries with very limited resources for marine conservation.

Background: The Seabird Information Network (SIN): Global Seabird Data Portal provides an easy way for seabird researchers to share information. The portal provides researchers and managers with up-to-date tools to store data and visualize population trends, seabird distribution, and reproductive success, which all serve as proxies to the overall health of marine ecosystems. Researchers have a place to archive data and make it available to other scientists, which also helps identify areas needing additional study, or help restoration planning efforts or endangered species recovery. Managers are provided an important tool for developing land protection plans, conducting environmental assessments, and planning response to oil spills and ship groundings. Coordinating the collaboration and communication among groups involved in seabird issues, research, and management activities across the global oceans is a primary goal of the World Seabird Union. A fully integrated seabird data portal will improve conservation and management plans by making seabird data available to regional, national, and international databases used in guiding policy and management initiatives for multiple seabird species.

Summary of Work Completed

Objective 1. Linking existing databases

1.1 BirdLife International Marine IBA Database: Various national and regional seabird colony databases and inventories have been developed in a wide variety of formats and with varying degrees of permanence. Recently the Important Bird Areas (IBAs) initiative of BirdLife International has achieved almost worldwide appraisal of the more important seabird breeding sites (and has reviewed many additional candidate sites in the process). We have worked closely with Ben Lascelles (Marine IBA Programme Officer, BirdLife International) who has led work to populate the Global Seabird Colony Data Entry Excel Template with seabird colony data using BirdLife's Marine IBA database (comprising some 2,000 sites worldwide). Colony data were also included for an additional 1,500 sites that were reviewed but did not qualify as IBAs. These colony data have been sent to our database development team for inclusion in the Global Seabird Colony Register.

1.2 Caribbean, Bermuda, and West Indies: Dr. Will Mackin, Co-Chair of the Seabird Working Group of BirdsCaribbean (formerly the Society for the Conservation and Study of Caribbean Birds, or SCSCB), has contributed the seabird colony database compiled for the Caribbean, Bermuda, and the West Indies. Dr. Mackin continues to work with our database development team during the importation process of the Caribbean colony data.

1.3 Southern Africa: The South African Ministry of the Environment maintains a database relating to seabird colonies in South Africa and Namibia. Dr. Ross Wanless (African Seabird Group) and Dr. Rob Crawford (Ministry of Environment), have overseen Andrea Angel, who has led the process of reformatting the southern Africa seabird colony data for the Global Seabird Colony Data Entry Excel Template. Those data have been compiled and will be sent to our database development team for inclusion in the Global Seabird Colony Register.

Objective 2. Remote data entry by seabird organisations (or holders of seabird site data), who may also be compiling national/regional databases simultaneously

2.1 Australia, starting with Victoria, via Australasian Seabird Group (Dr. Peter Dann)

2.2 Western Indian Ocean, via Indian Ocean Seabird Group (Prof. Matthieu Le Corre)

2.3 New Zealand, via NZ Forest & Bird (Dr. Chris Gaskin)

2.4 South Pacific, via BirdLife Pacific regional team (Mr. Jez Bird, Mr. Steve Cranwell)

With the exception of item 2.1 (Australia seabird colony data via the Australasian Seabird Group), we were able to obtain colony data for the Western Indian Ocean, New Zealand, and the South Pacific. Colony data were reformatted from existing databases or inventories into the Global Seabird Colony Data Entry Excel Template. Additionally, we were able to add colony data for Argentina with the assistance of Dr. Pablo Yorio and his colleagues in South America. These data have been sent to our database development team for inclusion in the Global Seabird Colony Register.

Objective 3. Remote data entry from published literature for countries/areas lacking any seabird organisation

3.1 Iran/Arabia (over 100 sites and 2000 species/site entries)

3.2 Indonesia (about 50 sites and 500 species/site entries)

3.3 China (about 50 sites and 600 species/site entries)

3.4 Malaysia (about 30 sites and 500 species/site entries)

The sources for these data are principally two publications (Croxall *et al.* 1984, Croxall 1991), supplemented by any more recent published data. BirdLife International provided the data entry/evaluation and compiled these published seabird colony data into the Global Seabird Colony Data Entry Excel Template. Data will be sent to our database development team for inclusion in the Global Seabird Colony Database.

PROJECT FUNDS FOR GLOBAL SEABIRD COLONY REGISTER DEVELOPMENT

Global Seabird Colony Register Project		Funds
1.1 BirdLife Marine IBA database		
	Mr.Ben Lascelles, Mr. Phil Taylor, Dr. Ian May	1,666
1.2 Caribbean, Bermuda and West Indies		
	Dr. Will Mackin	1,666
1.3 Southern Africa		
	Dr. Ross Wanless, Dr. Rob Crawford	3,666
	Sub-total	**$6,998**
2.1 Australia, starting with Victoria, via Australasian Seabird Group		
	Dr. Peter Dann	0
2.2 Western Indian Ocean, via Indian Ocean Seabird Group		
	Prof. Matthieu Le Corre	4,000
2.3 New Zealand, via NZ Forest & Bird		
	Dr. Chris Gaskin	2,000
2.4 South Pacific, via BirdLife Pacific regional team		
	Mr. Jez Bird, Mr. Steve Cranwell	0
	Sub-total	**$6,000**
3.1 Iran/Arabia (over 100 sites and 2000 species/site entries)		
3.2 Indonesia (about 50 sites and 500 species/site entries)		
3.3 China (about 50 sites and 600 species/site entries)		
3.4 Malaysia (about 30 sites and 500 species/site entries)		
	Sub-total	**$4,000**
	Total	**$16,998**

STATUS OF INVOICES FOR SEABIRD COLONY DATA COORDINATION

Invoice Received

- Western Indian Ocean Seabird Colony Data Coordination
- New Zealand Seabird Colony Data Coordination and Marine Important Bird Areas
- Southern Africa Seabird Colony Data Coordination
- Caribbean Seabird Colony Data Coordination

Awaiting Invoice

- BirdLife International Marine Important Bird Areas and Seabird Colony Data Coordination

GRANT FOR WORLD SEABIRD CONFERENCE II

Proposal Information: In June 2013 WSU submitted a proposal request to the PSG EXCO.

Proposal Request: We estimate that the total budget for WSC II will be about USD$300,000. Registration fees will cover about $160,000, leaving the WSU to raise $140,000. A contribution from PSG would provide a down payment for the conference facility. We have two bids and the down payment could be as much as $32,000, however we are still negotiating with two venues. We request that PSG consider a contribution of up to $23,000 towards the deposit to the conference facility for the WSC II. If the deposit is less than $23,000, the remainder will be returned to PSG. Funds currently held by WSU are committed to ongoing

projects, and the WSU essentially has no funds to apply towards the necessary deposit for the conference facility. We are applying for other grants, and the funds from PSG also will provide us with a match for other grants.

In a letter dated 26 July 2013, PSG chair Doug Forsell confirmed that PSG would provide up to $23,000 as a deposit towards a venue for the WSC II with the following seven stipulations (replicated verbatim here):

1. The grant is for up to $23,000 for the deposit on the venue. If the required deposit is less than $23,000 then the grant will be for the lesser amount. The maximum total is $23,000 including currency exchange fees, bank transfer fees, or credit card charges.
2. If determined by the treasurer to be advantageous to PSG and/or there is some extra assurance of the money being returned if the venue falls through, we will make the payment to the venue with our credit card.
3. The meeting will be held at a major hotel chain or a public conference center, reducing the chance of losing the deposit if the venue goes out of business.
4. I will serve as a PSG representative on the selection committee as an advisor in selecting the venue and in reviewing the contract.
5. We will work with WSC to help avoid some of the pitfalls we experienced, such as if the meeting is held at a venue with expensive rooms and there is less expensive lodging nearby, that the contract is realistic as to the number attendees staying at the venue's lodging.
6. If for whatever reason, the WSC II is not held, the funds will be returned to the PSG general fund.
7. If the meeting is successful and there is money that is raised for the meeting and not spent, the ExCo encourages the WSU to save a large portion of the funds to be used as seed money for a third conference.

WSU has decided on a venue that should meet these stipulations (Cape Town International Convention Centre, which is the premier location for conventions in Cape Town and hosts many international meetings) and respectfully requests that PSG pay $23,000 as a down payment to the Cape Town International Convention Centre.

PSG NEWS

Read about letters sent by the PSG Conservation Committee regarding a variety of seabird conservation issues, appointment of new PSG Coordinators, the upcoming 42nd Annual PSG Meeting, the 2015 Lifetime Achievement Award and other news.

PSG Conservation Actions: Letters

Over the past year, and in addition to the comment letter on the Army Corps of Engineers' DEIS for Double-crested Cormorant management described earlier in this issue in the Conservation Report, the Conservation Committee compiled several letters on behalf of PSG addressing concerns and responses to a variety of seabird conservation issues. A brief summary of letters is provided below. Complete letters can be found online on the Conservation page of PSG's website.

In May 2014, a letter was sent to the Regional Director of the Alaska Region of the U.S. Fish and Wildlife Service (USFWS) regarding the monitoring of Kittlitz's Murrelets (*Brachyramphus brevirostris*) and Aleutian Terns (*Onychoprion aleuticus*) in Alaska. The letter describes priorities for implementation of the Fish and Wildlife Conservation Act, which requires the USFWS to monitor and assess the status and trends of all bird species, subspecies, and populations.

In March 2014, a letter was sent to the Pacific Fishery Management Council, Portland, Oregon, regarding the Fisheries Ecosystems Plan and Initiative 1 for the protection of currently unmanaged and unfished forage species. In this letter, PSG underlines the importance of maintaining long-term abundance and wide distribution of forage fishes within the California Current Ecosystem for the health of seabird populations along the entire Pacific coast.

Also in March 2014, PSG and its Marbled Murrelet Technical Committee were invited to comment on the "Proposed Recovery Strategy for the Marbled Murrelet (*Brachyramphus marmoratus*) in British Columbia," issued by Environment Canada. Serious concerns about the proposed Recovery Strategy were raised, as it could result in as much as a 30% decrease in Marbled Murrelet habitats and populations over 30 years.

In February 2014, PSG commented to the U.S. Army Corps of Engineers District Office on the "Draft Environmental Assessment – Caspian Tern Nesting Habitat Reduction, East Sand Island, Clatsop County, Oregon." The PSG favored the "no action" alternative until the Corps and cooperators have completed an integrated, multispecies, regional-scale plan, and identified and made available one or more quality coastal nesting sites for Caspian Terns.

Also in February 2014, PSG supported the grant application by the California State Parks Department for preparation of a Marbled Murrelet Management Plan in Zone 6 with a letter sent to the Wildlife Branch of the California Department of Fish and Wildlife, Sacramento, California.

In a December 2013 letter to USFWS, PSG supported the eradication of the invasive House Mouse (*Mus musculus*) from South Farallon Island by aerial broadcast of rodent bait containing Brodifacoum-25D. The Farallon National Wildlife Refuge comprises the largest seabird breeding colonies in the contiguous United States. This second-generation anticoagulant brodifacoum has been used successfully to eradicate alien rodents from islands for more than 20 years. Nonetheless, PSG also recognized that there are risks in the application of brodifacoum or other poisons in terms of short-term, non-target mortality and other unintended consequences, but long-term benefits are promising.

A letter was sent to President Barack Obama in October 2013 regarding the increased protection needed for the threatened Marbled Murrelet due to conflicts with current logging proposals. In this letter, PSG respectfully requested that the Departments of Interior and Agriculture review and modify their management of Oregon and California railroad lands to ensure long-term conservation of Marbled Murrelets and to maintain large continuous blocks of habitat across this landscape. In addition, PSG requested the crafting of legislation that provides effective, long-term habitat protection for the murrelet and the means for the species' recovery.

New PSG Coordinators appointed

Three new Coordinators were appointed at the EXCO in 2014. Robb Kaler (USFWS and PSG Regional Representative for Alaska and Russia) and Heather Renner (USFWS) were appointed as the new co-coordinators of the Seabird Monitoring Committee. Robb and Heather are taking over from Scott Hatch (U.S. Geological Survey), who recently retired from this position. With this new appointment, the Pacific Seabird Monitoring Database (PSMD), formerly hosted on a USGS server, must be moved to another server. However, a motion was amended by EXCO to get it back online, identify data sets that need updating, and develop a five-year plan for managing the PSMD. Jennifer Ma (University of Washington) was appointed as the new Membership Coordinator. Jennifer has taken over the Membership Coordinator from Michele Hester (Oikonos Ecosystem Knowledge). As Membership Coordinator, Jennifer will work closely with the PSG Treasurer Christine Ogura and oversee the web-based system for paying duties—a major task—and provide mailing lists for EXCO members. Hannah Nevins (American Bird Conservancy) was appointed as Communications Coordinator, a new EXCO position. PSG welcomes the new Coordinators and warmly thank previous Coordinators for their hard work on behalf of PSG.

2015 Lifetime Achievement Award for David G. Ainley

PSG is proudly honoring David G. Ainley with the 2015 Lifetime Achievement Award for his outstanding effort to establish the Ross Sea as a Marine Protected Area and for his groundbreaking work on Adélie Penguins (*Pygoscelis adeliae*) in Antarctica (he even got a prominent peak named in his honor—check out Ainley Peak!). With this Award, PSG also honors David's long-term research on the distribution of birds and mammals at sea on the US West Coast and in the Eastern Tropical Pacific, and his current work as Editor-in-Chief of Marine Ornithology, a peer-reviewed journal published by PSG.

PSG Conservation Committee

To increase PSG's conservation capacity, the creation of a permanent Conservation Committee was proposed at the EXCO meeting in Juneau in February 2014. Regional Representatives are encouraged to contact Stan Senner, Vice-Chair for Conservation (Conservation@PacificSeabirdGroup.org), regarding conservation issues within their regions. It was further established at the EXCO meeting that PSG members should provide expertise to draft PSG's comment letters when doing so does not present conflicts of interest.

PSG supporting World Seabird Conference II

PSG will provide $23,000 in support for the 2nd World Seabird Conference at the Conference Centre in Cape Town, South Africa. The conference is set to take place 26–30 October 2015 and is hosted by the World Seabird Union (WSU) and The African Seabird Group. PSG is one of the largest member organizations of WSU, which was formed during the 1st World Seabird Conference held in 2010 in Victoria, Canada. The mission of WSU is to place seabird research, management, and conservation into a worldwide perspective. For more information about the Conference, please visit www.worldseabirdconference.com.

Chinese Crested Tern Committee disbanded

PSG's Chinese Crested Tern Committee was disbanded during the EXCO meeting in Juneau as requested by the Coordinators and Members of the Committee. The rare and endangered Chinese Crested Tern (*Sterna bernsteini*) occurs only on the islands of Matzu (administered by Taipei), Jiushan, and Wuzhishan (the latter two in Zhejian Province, People's Republic of China). Major threats to this species include egg poaching, disturbance by human visitors, and competition from Greater Crested Terns (*Thalasseus bergii*) for high-quality nest sites. The Committee was formed with the aims of fostering study of this critically endangered seabird and dialog about its conservation and initiating development of an action plan. Those aims have been achieved, and our Chinese and Taiwanese colleagues have taken the lead on work on this species. For more information about conservation of the Chinese Crested Tern, see the Conservation Report in this issue.

MEETING NEWS

PSG's 41st ANNUAL MEETING, FEBRUARY 2014

Sadie Wright and Yumi Arimitsu

The Pacific Seabird Group's 41st Annual Meeting was held at the Centennial Hall Convention Center in Juneau, Alaska, on February 19-22, 2014, and had more than 175 attendees. The meeting kicked off with a day of committee meetings, including the PSG Executive Committee, the Marbled Murrelet and Kittlitz's Murrelet Technical Committees, and the Seabird Monitoring Committee.

Three days of scientific presentations were scheduled. Each day began with a plenary lecture followed by two concurrent sessions: a Special Paper Session and other contributed papers. Scientific Program Chair Jo Smith and PSG meeting organizers demonstrated their adaptability by acting quickly to modify the schedule when two plenary presenters canceled at the last minute. Nariko Oka's plenary was replaced with a screening of the film "Pretty Slick" about oil spill response following the Deepwater Horizon blowout in the Gulf of Mexico. Julia Parrish gave the Lifetime Achievement Award presentation to Tony Gaston, who was able to attend via video conference on the big screen during his scheduled plenary time. Technology can be a very good thing.

Kim Rivera chaired the Awards Committee. PSG presents awards each year for the best student paper and poster. The best student poster award was given to Ai Yamashita. Paul Regular was awarded best presentation by a Ph.D. student, and Nobuhiko Sato was awarded best presentation by a M.Sc. student. PSG also provides modest travel awards to help people attend the meeting. Thirteen students (eight from the U.S. or Canada, and five from other countries) were

Post-PSG birding field trip to the Mendenhall Glacier, Juneau, AK. ***Trip leader:*** *Gus van Vliet. Back,* ***standing:*** *Chuck Pell, Reggie David, Chang-uk Park, Seul-Gi Seo, Caroline Poli, Kim Nelson, ??, Doug Forsell, Catherine Horswill, Peter Dann, John Croxall, Harry Carter.* ***Front:*** *Hyun-young Nam, Chang-yong Choi, Kuniko Otsuki, Vivian Mendenhall, Kim Rivera, Gus van Vliet, Simba Chan. Not pictured: David Pereksta, Katie O'Reilly. Photo: Bev Agler.*

awarded $440 each, and six scientists from outside the U.S. and Canada were awarded $333 each.

Special Paper Sessions included Arctic Seabirds, Hawaiian Seabirds, Fisheries Bycatch, Japan and Korean Seabirds, and Oiled Seabird Rescue. Other contributed talks were grouped into the following sessions: Population Biology, Breeding Biology, Tracking and Distribution, Foraging Ecology, and Contaminants/Restoration/ Management. There were 89 presentations and 24 posters featured at the meeting.

Local Committee Co-Chairs Sadie Wright and Yumi Arimitsu sport stylish PSG bling on banquet night in Juneau. Photo: Adrian Gall.

In addition to the committee meetings held on the first day, additional meetings were scheduled throughout the conference, including meetings of the Japan Seabird Conservation Committee, the Aleutian Tern Working Group, and the North Pacific Albatross Working Group.

On the first day of scientific presentations, meeting participants enjoyed a buffet lunch across the parking lot from Centennial Hall in the Juneau Arts and Culture Center while attending the PSG Member's Meeting led by PSG Chair Doug Forsell. Participants enjoyed a box lunch the following day, and many attended the Conservation Meeting led by Stan Senner.

For the first time ever, the PSG meeting included a closing plenary lecture, with George Divoky, David Ainley, Alan Springer, and Stan Senner joining forces to summarize the meeting from their various perspectives. They also paid tribute to longtime member and PSG co-founder, Jim King, who lives in Juneau and attended the meeting.

Networking social events at the meeting included an ice breaker, a poster session, and a student mentoring session hosted at different Juneau venues replete with hors d'oeuvres and plenty of liquids. The traditional banquet was held the final evening, followed by the Awards Ceremony, and a popular Juneau rock band that kept things hopping until late. The PSG headbands came in handy. Alexis Will was responsible for coordinating vendors to produce the tote bags, headbands, and t-shirts for the meeting using artwork donated by local artist Jim Fowler. Local catering company Abby's Kitchen provided excellent meals, snacks, and coffee throughout the conference.

Attendees arriving early or staying in Juneau after the meeting enjoyed the sunny, brisk weather while participating in a variety of field trips. A bus field trip explored some of the local land-based birding hotspots and sightseeing areas around Juneau, including a hike across frozen Mendenhall Lake to approach icebergs in front of the Mendenhall Glacier. Some attendees opted to explore the Inside Passage aboard Alaska Marine Highway System ferry trips to the far flung communities of Pelican, Gustavus, Haines, and Skagway. Some attendees even arrived or departed the meeting on the ferry to/from Bellingham, Washington. Alcids abounded, along with observations of cormorants, gulls, mergansers, a host of sea ducks, and marine mammals, including Steller sea lions, harbor seals, Dall's and harbor porpoises, humpback whales, and orcas. Northern lights made an appearance nearly every night of the meeting.

Yumi Arimitsu and Sadie Wright co-chaired a Local Committee of hard working volunteers—what would PSG do without volunteers?!—to pull off this successful meeting. As a side note, the meeting exceeded budgeting expectations and earned PSG a profit for the general fund. Thanks to everyone who contributed!!

2015 ANNUAL MEETING WILL BE IN SAN JOSE

We are pleased to announce that the 42nd Annual Meeting of PSG will take place in San Jose, California from 18-21 Feb 2015. Scott Schaffer (San Jose State University) is chairing the Local Committee. The theme of the meeting will be "A Future for Seabirds." Along with the usual contributed sessions, several exciting Special Paper Sessions are planned.

The conference will be held at the San Jose Airport Garden Hotel, located in the heart of San Jose. This is a location convenient to restaurants, coffee shops, light rail, and the San Jose International Airport. Lodging will be available at the conference venue and at a variety of other hotels in the immediate vicinity.

The San Francisco Bay area has a diversity of habitats for seabirds including estuarine, coastal, open ocean, and the bay itself. Five fantastic field trips have been organized for meeting participants, some on 15 February (before the meeting) and some on 23 February (after the meeting).

Like last year, PSG will use an online system for everything! Details can be found on the PSG website and/or on RegOnLine (www.regonline.com/psg2015). There you will find information about abstract submission (now closed!), travel awards, registration, field trips, merchandise, accommodation, and travel options to San Jose.

EXECUTIVE COUNCIL MINUTES

The Pacific Seabird Group's board of directors, the Executive Council (EXCO), meets at each Annual Meeting and once or twice a year via conference call. Minutes are available after they are approved at the subsequent meeting. A summary in Pacific Seabirds, and the full text is available on PSG's website. All PSG members are welcome to attend EXCO meetings.

SUMMARY OF MINUTES OF THE EXECUTIVE COUNCIL MEETING

19 February 2014 Annual Meeting Juneau, Alaska

Highlights of these Minutes:

- Secretary Pat Baird established TurboBridge for conference calls.
- Treasurer Lindsay Young automated online membership registration and hired a bookkeeper and accountant.
- Treasurer also automated online abstract submission for meetings (RegOnline).
- Secretary established Survey Monkey for polls and Bylaws changes ballots sent to membership, and also for annual elections of the ExCo.
- Chair Doug Forsell finalized "Protocol to certify tree-climbers for studies on Marbled Murrelet."
- PSG addressed many conservation issues in 2013 and has a number of new conservation issues ahead in 2014 (see report). Annual Meeting venue for 2015 decided: San Jose.
- Chinese Crested Tern Committee is now disbanded. EXCO vote is needed to formalize.

EXECUTIVE COUNCIL REPORTS

Treasurer's Report

PSG paid for seabirds.net ($7,998). We have a new surety bond for 2014-2015 for: Chair, Past Chair, Treasurer, and Editor of *Pacific Seabirds*. RegOnline is working well for membership renewals-good data collection for members. Membership is 481 paid members.

Vice-chair for Conservation's Report

Issues that PSG addressed this past year: (1) letter to Pacific Fisheries Management Council re: Fisheries Ecosystem Plan; (2) statement to Army Corps Engineers' assessment of managing birds at mouth of Columbia River in relation to endangered salmonids; (3) letter to California State Parks re their Plan for Management of Big Basin State Park; (4) letter to encourage USFWS to finalize Brown Pelican integrated monitoring plan; (5) letter to President Obama asking Departments of Interior and Agriculture to play more effective role in management of murrelet habitats on California and Oregon railway lands; and (6) letter to support USFWS's draft environmental impact statement for use of second generation anti-coagulants for mouse eradication on South Farallon NWR.

Items that PSG may have to address in 2014: (1) Wind farm proposal off Coos Bay Oregon-first on west coast; (2) Cormorant management plan for Columbia river estuary (largest cormorant colony in western U.S.); (3) petition by National Resources Defense Council to list the Tufted Puffin in California, Oregon, and Washington. Likewise, PSG will start addressing conservation issues in member countries (e.g., pipeline and wind farms proposed in Canada).

Suggested creation of a permanent Conservation Committee and have a list of experts in various fields to help draft PSG's comment letters.

Chair-elect's Report

Summarized makeup of 2014 meeting attendees: 30% academic, 27% state and provincial, almost 25% early-career and student.

Past Chair's Report

The Past Chair's duty is to provide information on the location of the next Annual Meeting (San Jose, in 2015), the proposed site of the meeting to be held in two or years, and a choice of two or three sites for the meeting to be held in three years. Past Chair has not come up with alternative venues or possible Local Committee chairs for 2015 or 2016.

Student Representative's Report

Proposed two Student Representatives and that either they overlap with staggered terms (i.e., one elected each year for a one-year term), or one serve as "representative-elect" (not yet a member of ExCo). This would be a Bylaws change.

Pacific Seabirds Editor's Report

A committee will decide on the journal's future. A periodical journal/bulletin is a valuable record of PSG's history and is needed for archival purposes. Some sections of PS could be posted online throughout the year if they were timely.

ANNUAL MEETING UPDATES

2015 Annual Meeting: Scott Schaffer has been proposing San Jose for the 2015 meeting since 2012; it has good public transportation and many hotels. At the end of the meeting, Scott sent a proposal for a meeting in San Jose.

Future Meetings survey: A poll was administered on the listserv. Questions: (1) "Who is going to attend the 2015 meeting of PSG?" Of 159 respondents (from listserv), 32% said they were planning on attending, and 24% said they might attend. Thirty percent said that if they attended the WSC II in 2015, they would not attend PSG's 2016 meeting, and 70% said they would. (2) "Should PSG meet with the WSC II in South Africa in October 2015," 30% said yes, 34% said no, 4% had no opinion. (3) Timing for future meetings: January/February. (4) Preference for joint meetings with other groups: 54% yes 45% no. (5) Asking for volunteers to host future meetings: four people were willing to host a meeting. (5) "Places where members would like to meet" (in order of preference): California; Hawai'i; Mexico; Portland, Oregon; Seattle, Washington. Most comments regarding meeting venues were about the need for funds to get there.

Future meetings discussion: EXCO has to determine whether members want a joint meeting with World Seabird Union (WSU) or with the Waterbird So-

ciety (WBS). Joint meeting with WSU or the Waterbird Society proposed for 2016 (both held in Fall 2015). Poll showed little support for a joint meeting with WSU: 60% members were either opposed or uncertain. Concern expressed that attendance at PSG 2016, in the wake of WSC II in South Africa, will be low. PSG members attending WSC II won't have time or resources to attend PSG 2016.

OTHER BUSINESS

Website: PSG will start to provide some introductory pages on seabirds for the public—what they are, their role in ecosystems, etc.

Listserv: The listserv will be moved from the Federal Government server to Blue Host (where website resides).

Conflict of Interest Statement: Necessary under California law. Need to modify the draft Conflict of Interest Statement to include definitions as well as all potential conflicts of interest clearly laid out. Tabled until these definitions are added.

Code of Conduct (CoC): Should include guidance and recourse, in case one PSG member is unable to handle a difficult interaction with another. It should also cover conflicts of interest. Discussion if Life Members might be concerned in having a CoC since they finalized their memberships before a CoC existed. Also, who would approve the CoC?

Bylaws amendments—future amendments: PSG Bylaws need to be brought into conformity with California law regarding Ex-Officio and Proxy EXCO members. A suggestion was made that Life Member fees go into the General Fund.

Marine Ornithology: The editor, Tony Gaston, wants a discussion about evolution and future of *Marine Ornithology* and the need for a Communications Coordinator. Hannah Nevins volunteered to fill this role.

Elections Committee: The vote for Student Representative ended in a tie between Abraham Borker and Andrew Titmus. Bylaws state that EXCO discuss both candidates and appoint one of them. Both candidates were highly qualified and motivated.

MOTIONS

Retain an attorney: EXCO approved retention of an attorney on a need-only hourly basis to (1) determine what PSG's legal obligations are to respond to questions that PSG receives regarding the organization; and (2) to have that attorney respond on PSG's behalf if a response is required. Note: This was recommended by PSG's accountant. Furthermore, if the cost exceeds $2,000, an EXCO vote would be required for approval.

Funding for the Pacific Seabird Monitoring Database: EXCO approved allocating up to $2,400 for two years; benchmarks to include (1) put the database back online; (2) identify datasets that need updating, and enter updates where feasible; and (3) develop a five-year plan.

PSG 2015 will be held in San Jose: EXCO approved San Jose as the location for the 2015 meeting, on a date in January or February to be determined; Scott Schaffer will be Local Committee Co-chair. Doug Forsell will be Local Committee Co-chair if someone else doesn't volunteer.

PSG annual meeting poster: EXCO approved spending up to $800 for delivery, within one year, of a stand-alone poster to be used at meetings.

Code of Conduct: EXCO approved creation of a committee to draft a Code of Conduct and decide how it should be approved. Vivian Mendenhall volunteered to be on the committee (but not to chair it).

Migration of PSG listserv off of USFWS server: EXCO approved purchasing a perpetual license for the listserv with a one-time expenditure and to pay all associated annual maintenance and service fees, including upgrades; not to exceed $3,000.

Communications Coordinator: EXCO approved the appointment of Hannah Nevins as Communications Coordinator.

Chinese Crested Tern Committee: EXCO approved disbanding this committee.

Student Representative: EXCO approved selection of Andrew Titmus as Student Representative.

INTERIM EDITOR'S NOTE

Vivian Mendenhall left large shoes to fill for a one-issue interim editor, and I have shuffled forth as best I could. Fortunately, a fine group of assistant editors responded to my request for help. I offer sincere thanks to Heather Major, Marc Romano, Leslie Slater, Julia Sommerfeld, and Breck Tyler for their hard work to help obtain, compile, and edit the content for *Pacific Seabirds* 41(1-2). They have expeditiously elicited, drafted, and/or reviewed content for this issue. Working long-distance with this group has been a pleasure and has made creating this issue a truly collaborative effort. All credit for the fine layout in this issue goes to Patrick Stark and his considerable graphic design skills. This has been a temporary collaboration, however. Thanks also to Jo Smith, Pat Baird, Jennifer Ma, and Christine Ogura for responding to my various content and PSG-process questions and requests along the way.

At this time, PSG is looking for a new editor for *Pacific Seabirds*. If you are interested, or if you have questions about this publication, please contact the PSG Chair at: Chair@pacificseabirdgroup.org. ***– Holly Freifeld***

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

The Pacific Seabird Group publishes symposia and other works. **PSG Symposia** are occasionally held at Annual Meetings; those which have been published are listed below. **Technical Reports** prepared by PSG working groups also are listed. ***To order one of these PSG publications, please see instructions after each item***.

Abstracts of papers and posters given at PSG meetings are published annually. Abstracts for meetings of 1974 through 1993 appeared in the *PSG Bulletin* (Volumes 2–20); for meetings of 1994 through 2003, in *Pacific Seabirds* (Volumes 21–30); and for meetings of 1997 and later, at www.pacificseabirdgroup.org

PSG publishes the journals ***Pacific Seabirds*** (www.pacificseabirdgroup.org) and ***Marine Ornithology*** (www.marineornithology.org). Current and past issues of both journals are available online or by subscription. Back issues may be obtained online.

SYMPOSIA

SHOREBIRDS IN MARINE ENVIRONMENTS. Frank A. Pitelka (Editor). Proceedings of an International Symposium of the Pacific Seabird Group. Asilomar, California, January 1977. Published June 1979 in Studies in Avian Biology, Number 2. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

TROPICAL SEABIRD BIOLOGY. Ralph W. Schreiber (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Honolulu, Hawaii, December 1982. Published February 1984 in Studies in Avian Biology, Number 8. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

MARINE BIRDS: THEIR FEEDING ECOLOGY AND COMMERCIAL FISHERIES RELATIONSHIPS. David N. Nettleship, Gerald A. Sanger, and Paul F. Springer (Editors). Proceedings of an International Symposium of the Pacific Seabird Group, Seattle, Washington, January 1982. Published 1984 as Canadian Wildlife Service, Special Publication. *Out of print; **available free of charge at*** www.pacificseabirdgroup.org

THE USE OF NATURAL VS. MAN-MODIFIED WETLANDS BY SHOREBIRDS AND WATERBIRDS. R. Michael Erwin, Malcolm C. Coulter, and Howard L. Cogswell (Editors). Proceedings of an International Symposium at the first joint meeting of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Colonial Waterbirds 9(2), 1986. $12.00. ***Order from:*** Ornithological Societies of North America, PO Box 1897, Lawrence, Kansas 66044; phone (800) 627-0629; no online orders.

ECOLOGY AND BEHAVIOR OF GULLS. Judith L. Hand, William E. Southern, and Kees Vermeer (Editors). Proceedings of an International Symposium of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Published June 1987 in Studies in Avian Biology, Number 10. $18.50. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

AUKS AT SEA. Spencer G. Sealy (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published December 1990 in Studies in Avian Biology, Number 14. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

STATUS AND CONSERVATION OF THE MARBLED MURRELET IN NORTH AMERICA. Harry R. Carter, and Michael L. Morrison (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published October 1992 in Proceedings of the Western Foundation of Vertebrate Zoology, Volume 5, Number 1. $20.00. ***Available free of charge at*** www.pacificseabirdgroup.org

THE STATUS, ECOLOGY, AND CONSERVATION OF MARINE BIRDS OF THE NORTH PACIFIC. Kees Vermeer, Kenneth T. Briggs, Ken H. Morgan, and Douglas Siegel-Causey (editors). Proceedings of a Symposium of the Pacific Seabird Group, Canadian Wildlife Service, and the British Columbia Ministry of Environment, Lands and Parks, Victoria, British Columbia, February 1990. Published 1993 as a Canadian Wildlife Service Special Publication, Catalog Number CW66-124-1993E. ***Order free of charge from*:** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A OH3, Canada.

BIOLOGY OF MARBLED MURRELETS—INLAND AND AT SEA. S. Kim Nelson and Spencer G. Sealy (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Seattle, Washington, February 1993. Published 1995 in Northwestern Naturalist, Volume 76, Number 1. $12.00. ***Available free of charge at*** www.pacificseabirdgroup.org

BEHAVIOUR AND ECOLOGY OF THE SEA DUCKS. Ian Goudie, Margaret R. Petersen and Gregory J. Robertson (editors). Proceedings of the Pacific Seabird Group Symposium, Victoria, British Columbia, 8-12 November 1995. A special publication compiled by the Canadian Wildlife Service for the Pacific Seabird Group. Published 1999 as Canadian Wildlife Service Occasional Paper number 100, catalog number CW69-1/100E. ***Order free of charge from*:** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A OH3, Canada, ***or available free of charge at*** www.pacificseabirdgroup.org

SEABIRD BYCATCH: TRENDS, ROADBLOCKS AND SOLUTIONS. Edward F. Melvin and Julia K. Parrish (editors). Proceedings of an International Symposium of the Pacific Seabird Group, Blaine, Washington, 26-27 February 1999. Published 2001 by University of Alaska Sea Grant, Fairbanks, Alaska. Publication no. AK-SG-01-01. $40.00. ***Order from publisher.***

BIOLOGY, STATUS, AND CONSERVATION OF JAPANESE SEABIRDS. Yutaka Watanuki, Harry R. Carter, S. Kim Nelson and Koji Ono (conveners) and Nariko Oka (editor). Proceedings of an International Symposium of the Japanese Seabird Group and Pacific Seabird Group, Lihue, Hawaii, February 2001. Journal of the Yamashina Institute of Ornithology 33(2); Symposium (5 papers), pp 57-147, other papers pp. 148-213. In English with Japanese abstracts. $75.00. ***Order from PSG*** - contact the Chair at Chair@pacificseabirdgroup.org

OIL AND CALIFORNIA'S SEABIRDS. Harry R. Carter (convener) and Anthony J. Gaston (editor). Proceedings of a Symposium of the Pacific Seabird Group, Santa Barbara, California, February 2002. Published 2003 in *Marine Ornithology* 31(1). ***Available free of charge at*** www.marineornithology.org

The Biology and Conservation of the American White Pelican. Daniel W. Anderson, D. Tommy King, and John Coulson (editors). Proceedings of a Symposium of the Pacific Seabird Group. *Waterbirds*, Volume 28. Special Publication 1, 2005. Published by the Waterbird Society. $15.00. ***Order from PSG*** - contact the Chair at Chair@pacificseabirdgroup.org.

BIOLOGY AND CONSERVATION OF XANTUS'S MURRELET. Harry R. Carter, Spencer G. Sealy, Esther E. Burkett, and John F. Piatt (editors). Proceedings of a symposium of the Pacific Seabird Group, Portland, Oregon, January 2005. Published 2005 in *Marine Ornithology* 33(2):81-159. ***Available free of charge at*** www.marineornithology.org

SEABIRDS AS INDICATORS OF MARINE ECOSYSTEMS. John F. Piatt and William J. Sydeman (editors). Proceedings of an International Symposium of the Pacific Seabird Group, Girdwood, Alaska, February 2006. Published 2007 in *Marine Ecology Progress Series* Volume 352:199-309. ***Available free of charge at*** http://www.int-res.com/abstracts/meps/v352/#theme

The Salish Sea Ecosystem: Status and Impacts of Changes on Marine Birds. Scott Hatch (editor), Douglas F. Bertram, John L. Bower, and Patrick D. O'Hara (guest editors.) 2009. Marine Ornithology, Salish Sea Symposium Issue 37: 1-76. ***Available free of charge at*** http://www.pacificseabirdgroup.org/publications/Hatch.etal.2008.pdf

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

Information on presenting symposia: Pacific Seabird Group Symposia or Paper Sessions may be arranged by any member who is interested in a particular topic. Before planning a special session, refer to Meetings/Symposia Guidelines at www.pacificseabirdgroup.org; also contact the Scientific Program Chair for the annual meeting.

TECHNICAL PUBLICATIONS

EXXON VALDEZ OIL SPILL SEABIRD RESTORATION WORKSHOP. Kenneth I. Warheit, Craig S. Harrison, and George J. Divoky (editors). Exxon Valdez Restoration Project Final Report, Restoration Project 95038. PSG Technical Publication Number 1. 1997. ***Available free of charge at*** www.pacificseabirdgroup.org

METHODS FOR SURVEYING MARBLED MURRELETS IN FORESTS: A REVISED PROTOCOL FOR LAND MANAGEMENT AND RESEARCH. Pacific Seabird Group, Marbled Murrelet Technical Committee. PSG Technical Publication Number 2. 2003. ***Available free of charge at*** www.pacificseabirdgroup.org

---

PACIFIC SEABIRD GROUP COMMITTEE COORDINATORS FOR 2015

Committees do much of PSG's business, as well as the conservation work for which PSG is respected. The committees welcome (and need) information concerning their issues. Please contact one of these Coordinators with input, updates, to apply for a small grant (see PSG's website for eligiblilty), or if you wish to help a committee with its work.

AWARDS COMMITTEE

Doug Forsell, email: PastChair@pacificseabirdgroup.org; **Jo Smith**, email: Chair@pacificseabirdgroup.org; and **Kathy Kuletz**, email: ProgramChair@PacificSeabirdGroup.org

COMMUNICATIONS COMMITTEE

Hannah Nevins, email: Communications@pacificseabirdgroup.org

CONSERVATION COMMITTEE

Stan Senner, email: Conservation@pacificseabirdgroup.org

CORRESPONDING MEMBERS COMMITTEE

Melanie Steinkamp, email: Melanie_Steinkamp@fws.gov

CRAIG S. HARRISON CONSERVATION SMALL GRANTS COMMITTEE

Verena Gill, email: Listserv@PacificSeabirdGroup.org

ELECTION COMMITTEE

Alan Burger, email: PSG_Elections@pacificseabirdgroup.org

ENDOWMENT FUND TRUSTEES COMMITTEE

Kenneth T. Briggs, email: mola5946@yahoo.com; **Jim Kushlan,** email**:** jkushlan@earthlink.net**;** **and Christine Ogura**, email: Treasurer@PacificSeabirdGroup.org

PSG COMMITTEE COORDINATORS FOR 2015

JAPANESE AND KOREAN SEABIRD CONSERVATION COMMITTEE
Kuniko Otsuki, email: boomam@sa2.so-net.ne.jp and **Kim Nelson**, email: kim.nelson@oregonstate.edu

KITTLITZ'S MURRELET TECHNICAL COMMITTEE
John Piatt, email: jpiatt@usgs.gov

MARBLED MURRELET TECHNICAL COMMITTEE
Kim Nelson, email: kim.nelson@oregonstate.edu and **Peter Harrison**, email: peter.harrison@dnr.wa.gov

SEABIRD MONITORING COMMITTEE
Heather Renner, email: heather_renner@fws.gov and **Robb Kaler,** email: robbkaler@gmail.com

SCRIPPS'S MURRELET AND GUADALUPE MURRELET TECHNICAL COMMITTEE
Shaye Wolf, email: swolf@biologicaldiversity.org and **Harry R. Carter**, email: carterhr@shaw.ca

MEMBERSHIP COORDINATOR
Jennifer Ma, email**:** Membership@PacificSeabirdGroup.org

LISTSERVE COORDINATOR
Verena Gill, email: listserv@PacificSeabirdGroup.org

WEBMASTER
Lisa Ballance, email: Webmaster@PacificSeabirdGroup.org

WEBSITE COORDINATOR
Annette Henry, email: Info@PacificSeabirdGroup.org

PSG BOARD MEMBERS OF THE ORNITHOLOGICAL COUNCIL
Pat Baird, email: pab7@sfu.ca and **Doug Forsell**, email: DJForsell@aol.com

PSG DELEGATE TO THE AMERICAN BIRD CONSERVANCY
Melanie Steinkamp, email: Melanie_Steinkamp@fws.gov

PSG DELEGATE TO THE WORLD SEABIRD UNION
Patrick Jodice, email: pjodice@clemson.edu

PSG LIFE MEMBER 2014-2015

David Ainley
Sarah G. Allen
Daniel W. Anderson
Edgar P. Bailey
Pat Herron Baird
Lisa Ballance
Mrs. Don Bishop
Kenneth T. Briggs
Joanna Burger
Douglas Causey
Ellen W. Chu
Roger B. Clapp
Cheryl Conel
Kathy Cousins
Theodore L. Cross
Jeff Davis
Robert H. Day
Tony DeGange
Jan Dierks
George Divoky
Kyle Elliott
Stewart Fefer
Lloyd C. Fitzpatrick
Elizabeth Flint
Douglas J. Forsell
Michael Fry
Adrian Gall
Lisa Haggblom
Judith Latta Hand
Craig S. Harrison
Scott A. Hatch
Monica Herzig Zürcher
Nancy Hillstrand
Joel D. Hubbard
David B. Irons
Sarah Keller
Ronald Javitch
James G. King
Joohn Konecny
Kathy Kuletz
James Kushlan
Lora Leschner
David B. Lewis
Peter Major
Eugene Y. Makishima
Vivian Mendenhall
Pat Mock
Ken Morgan
Edward C. Murphy
S. Kim Nelson
Yasuaki Niizuma
Harou Ogi
Koji Ono
Steffen Oppel
Katie O'Reilly
Julia K. Parrish
Robert Pitman
Jennifer Provencher
C. John Ralph
Martin Renner
William P. Ritchie
Chad Roberts
Daniel D. Roby
Jan Roletto
Gerald A. Sanger
Palmer C. Sekora
Nanette Seto
Kouzi Shiomi
Joanna Smith
William E. Southern
Jeffrey A. Spendelow
Craig Strong
Takaki Terasawa
W. Breck Tyler
Enriqueta Velarde Gonzalez
Kees Vermeer
John S. Warriner
Yutaka Watanuki
Jennifer Wheeler
Jeff Williams

HONORARY MEMBER

John Cooper

RECIPIENTS OF PSG'S LIFETIME ACHIEVEMENT AWARD

Daniel W. Anderson
Philip and Myrtle Ashmole
James C. Bartonek
W.R.P. Bourne
Richard G.B. Brown
G. Vernon Byrd
John Cooper
Malcolm Coulter*
John Croxall
Anthony Gaston
Charles Guiguet*
Michael P. Harris
Thomas R. Howell*
George L. Hunt, Jr.
Karl W. Kenyon*
James G. King
Haruo Ogi
Spencer G. Sealy
Robert E. Ricklefs
Miklos D.F. Udvardy*
John Warham*

**deceased*

RECIPIENTS OF PSG'S SPECIAL ACHIEVEMENT AWARD

Malcolm Coulter*
Franklin Gress
George J. Divoky
Craig S. Harrison
Hiroshi Hasegawa
Lora Leschner
Edward Melvin
Vivian Mendenhall
S. Kim Nelson
Arthur L. Sowls
Steven M. Speich*
Mark J. Rauzon
Yutaka Watanuki

**deceased*

MEMBERSHIP INFORMATION

Annual Membership
Members receive Pacific Seabirds, announcements of meetings, reduced rates on conferences and some publications, subscription to the PSG listserv, and most importantly, the knowledge of contributing to the study and conservation of Pacific seabirds wherever they occur. Annual membership is for one calendar year and expires each year on December 31.

Membership Rates
Individual membership: $40
Student membership: $30
Life membership: $1,200 (can be divided into five annual payments of $240)

All Life member contributions are dedicated to PSG's Endowment Fund, a fund to support the publications of the PSG, as are direct contributions to the Endowment Fund.

To Join
To join the Pacific Group or renew your membership, please go to:
https://www.regonline.com/psgmembership

Credit cards and checks are accepted on this site. To edit information on an existing membership, please follow the link above and login using the e-mail address that you used to renew your membership (please note that this may be different from your listserv email address).

If you have any questions, please notify our Membership Coordinator. The Membership Coordinator is responsible for maintaining the membership database, assisting members with updating their information, sending renewal reminders to members, sending new member information to the list serve coordinator, and dealing with the day-to-day membership inquires.

Member Resources

Sign up for a PSG membership, or renew a PSG membership at: https://www.regonline.com/psgmembership

Connect with the Pacific Seabird Group through our Facebook page at: https://www.facebook.com/PacificSeabirdGroup

Follow PSG on Twitter at:
http://twitter.com/#!/pacificseabirds

For access to the Pacific Seabird Group listserv, please contact the coordinator at: Listserv@PacificSeabirdGroup.org

PSG EXECUTIVE COUNCIL, 2014-2015

Officers

Chair	**Joanna Smith**, email: Chair@pacificseabirdgroup.org
Past Chair	**Doug Forsell**, email: PastChair@pacificseabirdgroup.org
Chair-Elect	**Kathy Kuletz**, email: ProgramChair@PacificSeabirdGroup.org
Vice-Chair for Conservation	**Stan Senner**, email: Conservation@PacificSeabirdGroup.org
Treasurer	**Christine Ogura**, email: Treasurer@PacificSeabirdGroup.org
Secretary	**Patricia Baird**, email: Secretary@PacificSeabirdGroup.org

Regional Representatives

Alaska and Russia	**Robb Kaler**, email: AK.RU_Rep@PacificSeabirdGroup.org
Canada	**Ken Morgan**, email: Canada_Rep@PacificSeabirdGroup.org
Washington and Oregon	**Peter Hodum,** email: WA.OR_Rep@PacificSeabirdGroup.org
Northern California	**Anna Weinstein**, email: NoCA_Rep@PacificSeabirdGroup.org
S California, Latin America, Hawai'i	**Annette Henry,** email: SoCA.HI.LA_Rep@PacificSeabirdGroup.org
Non-Pacific United States	**Iain Stenhouse,** email: US.exc_Rep@PacificSeabirdGroup.org
Europe/Africa	**Stefan Garthe**, email: EU.AF_Rep@PacificSeabirdGroup.org
Asia and Oceania	**Kuniko Otsuki**, email: Asia.Oc_Rep@PacificSeabirdGroup.org
Student Representative	**Andrew Titmus**, email: Student_Rep@PacificSeabirdGroup.org

Ex officio (non-voting)

Communications Coordinator	**Hannah Nevins**, email: Communications@PacificSeabirdGroup.org
Listserve Coordinator	**Verena Gill**, email: listserv@PacificSeabirdGroup.org
Membership Coordinator	**Jennifer Ma**, email: Membership@PacificSeabirdGroup.org
Webmaster	**Lisa Ballance**, email: Webmaster@PacificSeabirdGroup.org
Website Coordinator	**Annette Henry**, email: Info@PacificSeabirdGroup.org